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Opening of Congress

Lord Fortescue on World Peace and the Profession

THE 72nd Annual Congress of the Association was officially opened on Monday by the Earl Fortescue, K.G., P.C., C.B., O.B.E., M.C. Addressing the delegates, who had previously been welcomed by the Mayor, Councillor W. H. White, on behalf of the Corporation, Lord Fortescue said :—

" Mr. President, Mr. Mayor, Ladies and Gentlemen,

" This is the Association's 72nd Congress and the audience will reflect with pleasure on the remarkable growth of their profession in learning, numbers and prestige in so comparatively short a time.

" I have been connected with all animals for the whole of my life, especially with horses, and so from that point of view I have naturally taken a very great interest in everything connected with your profession, and I have a good many friends in it. I have judged horses in Canada, Argentine and Rhodesia.

" In the course of this week's deliberations you will be listening to scientific papers on the latest trends and discoveries of veterinary science and, additionally, your President will be addressing you on a number of aspects of your profession and of the work of your Association.

" It would be safe to say that the most vital topic of this post-war period is to maintain the peace of the world, and I would remind all veterinary surgeons that they have a great contribution to make to it. The basis of much of the unrest of the Asian continent, and elsewhere, is hunger and that is where the veterinarian has his great part to play. I saw recently some statistics which showed that the population of the world grew from 1,600,000,000 in 1900 to approximately 2,500,000,000 in 1950. If the present trends continue it is estimated that by 1980 there may be 4,000,000,000 people alive.

" Among this mass of human beings it has been suggested that more than 1,500,000,000 go hungry for at least part of every day.

" There are, in general, two kinds of food—grain, and meat with its ancillary products like butter, milk, eggs and so on. It is with the latter that the veterinary surgeon is concerned.

" Even in Britain where the quality of our livestock is as high as anywhere in Europe and the skill of farmers is notable, livestock disease and lowered productivity account for losses in the region of £80,000,000 every year. What must these losses be in the great Asian countries where the veterinary surgeons are sparse or non-existent, and the standard of husbandry is very low ?

" I have been informed that at a British Field Research Station having as part of its property three farms, the productivity of the estate has been increased 300 per cent. over a comparatively short period. Much of the land is not first-class. As there are a number of Field Research Stations doing valuable and important work it would be invidious perhaps to name this one, but the Director of it is an eminent veterinary surgeon.

" If this advance can be made in England where production is already good, what vast enterprises would seem to be possible in the backward countries.

" Hunger on a wide scale leads to unrest and unrest is the breeding ground for communism and war. The provision of sufficient food would, I believe, do as much, perhaps more, than any other single contribution to promote that stability which might help to avoid world conflict. That is the challenge to the veterinary profession everywhere.

" There have been articles in your journal, THE VETERINARY RECORD, written by Indian, native African, Egyptian and other veterinary surgeons. The importance of the art and science of veterinary surgery being taught to the students of other nations cannot be overemphasised. I hope to see, one day, an article from a Chinese veterinarian as I have been informed that public examination for veterinary diplomas was a feature of Chinese agriculture before the beginning of the Christian era.

" I would like to refer to the work of the late Dr. J. T. Edwards, in whose honour I understand it is intended to create a memorial scholarship. Here was a great English veterinarian who, while working in India, made fundamental discoveries in the protection of cattle against rinderpest, one of the great scourges overseas, which fortunately is no longer encountered in these islands. I believe that the same profession is producing more Edwards' who will help to control the great killing and disabling diseases among livestock which rob vast populations of so much food.

" I have so far spoken of the broad horizons, but I know that whenever anyone makes a speech concerning animals it is expected of him that he will make some reference to pets. The whole subject of kindness to domestic animals is one in which this nation has a great history. But I would say this. Much is written in the newspapers about the good work carried out by charitable bodies in this connection. Almost nothing is ever written about the great work of veterinary surgeons in the same field, because the etiquette of their profession forbids them to advertise what they do. I wonder, however, whether the public who patronise the welfare societies—sometimes passing by the private practitioner—realise that without the knowledge and experience of the trained veterinary surgeon and the teachings of veterinary science, welfare societies could hardly continue for a week.

" Lastly, I would wish to refer to the contribution made by the veterinarian in the general field of science. The audience knows and can be justly proud of the fact that one of the research workers who helped to turn penicillin from a great laboratory discovery into a practical and usable drug, was a distinguished member of their own profession.

" Certain surgical techniques which were first used on animals were later adapted in our hospitals for human beings.

" In the field of preventive medicine might it not be fair to say that the veterinary surgeon was far ahead of the doctor in the way he inoculated entire herds against diseases, rather than wait until disease broke out and then treat his patients one at a time.

" Many branches of science are so interlocked—I believe that biochemistry is one for example—that the veterinarian in his laboratory is a co-worker in the same field as the medical research worker in the hospital. Each is working for the ultimate benefit of his fellow men, than which there can be no nobler aim.

" In conclusion, I am sure all will realise the importance of your profession and how much your knowledge can add to the benefit of all people and animals throughout the whole world.

" I am only so glad that you have come to Devon for your annual conference."

OFFICIAL OPENING OF CONGRESS

Delegates assembled in full strength for the official opening of Congress by Lord Fortescue. The Mayor, Councillor W. H. White, had previously made a short speech of welcome on behalf of the Corporation, and the President, in reply, said: " Thank you, sir, for the warmth of your greeting to us, and from what we have seen of your town we have, I am sure, every expectation of a pleasant week. ' Haste ye back ' is often a parting greeting in my country and it must be that this Association in its 72 years of congress is returning to its old friends. Some here to-day have recollections of the hospitality of your town on a previous occasion in 1927. I know of the kindly help your officers have given, and we appreciate the facilities you have made available to us. On behalf of the British Veterinary Association I thank you and I hope you will find it possible to be with us on a number of occasions during our stay."

Lord Fortescue, who was most cordially received, referred, before his formal address, to the late Colonel Townsend whom he had known and esteemed both as personal friend and veterinarian since the first world war.

Lord Fortescue's address was heard with close attention, punctuated with applause. His observations on the contribution made by the profession to animal welfare—a contribution all too little known or appreciated by the general public—evoked especial approval. Delegates were interested in his references to the many places, over a long period of years, where he had acted as judge at horse-shows. Lord Fortescue is, of course, one of the best-known among judges and his experience of bloodstock, not only in his own country, but in Canada, America and Africa is renowned. Incidentally he played a notable part in the Coronation ceremonies, being one of the four Knights of the Garter who held the golden canopy over the Queen.

GENERAL ARTICLES

Cortical Activity in Electrocuted Dogs

BY

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IN many places in Great Britain where numbers of unwanted dogs and cats have to be destroyed, it has been the practice in recent years to kill them by electrocution in a specially constructed cabinet. The procedure is simple, rapid and effective. It has the additional advantage that it can be safely entrusted to a comparatively unskilled person. Certain doubts have, however, arisen as to what actually happens to the animals while they are in the cabinet.

From human experience in accidental electric shock (*e.g.*, Motton, 1936) and in electroconvulsant-therapy, it appears that for a shock to produce unconsciousness a substantial amount of current must pass through the brain. In the standard cabinet hitherto in general use for the electrocution of dogs and cats the arrangement of electrodes (Fig. 1) makes it extremely unlikely that sufficient current is passed through the head to produce unconsciousness. At the request of the British Veterinary Association, experiments have now been carried out to determine whether, in the routine procedure for electrocution, the shock itself does, in fact, produce unconsciousness or not.

It is difficult to apply the usual tests for consciousness in such a case as they depend on movements produced reflexly. During the shock most of the animal's muscles are in a state of tetanic contraction from the direct action of the current and cannot therefore exhibit reflex movement ; immediately after the current has been switched off, the musculature may still be prevented by fatigue from showing reflex movements. Such a state of paralysis—comparable to curarisation—is not necessarily associated with unconsciousness.

In the experiments to be described, the electrical activity of the brain was used as an index of the state of consciousness of the animal. The experiments were carried out on dogs. The animals were anaesthetised with cyclopropane (after induction with thiopentone), electrodes were implanted in the skull, the wires leading from these electrodes were passed under the skin to emerge just behind the shoulder-blades, the wounds were closed, and the animals were allowed to recover from the anaesthetic. The wires coming through the skin were led to a connection-block carried in a harness on the back of the animal. Records of the electro-

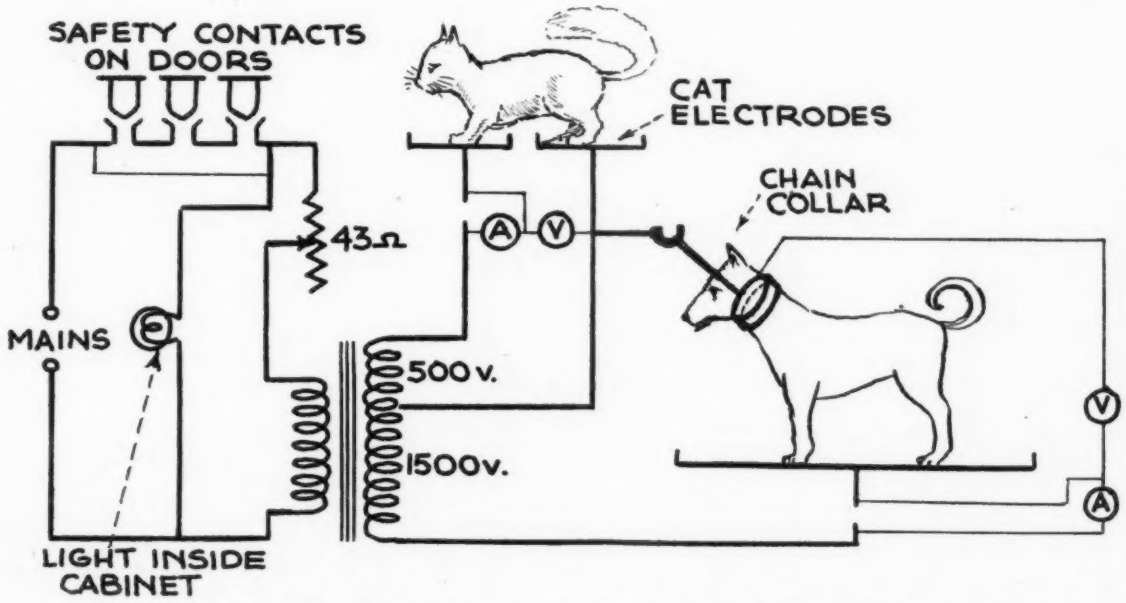

FIG. 1.—Circuit of standard cabinet used for the electrocution of dogs and cats. The thin lines indicate the modifications introduced for recording currents and voltages.

encephalogram (E.E.G.) could then be obtained at will. The animals recover from the operation very rapidly and do not appear to be in any way inconvenienced. With this procedure it is possible to obtain characteristic records while the animal is certainly conscious and apparently in a normal state. If the animal is now anaesthetised or goes to sleep, characteristic changes occur in the E.E.G. The occurrence of fits or seizures can also be very readily detected.

Methods

The E.E.G. electrodes were each carried in a small cylindrical metal carrier, open at both ends and furnished with a screw thread on the outside and with flats by which it could be gripped and turned. The end of the recording lead was fixed into this carrier with insulating material. A small piece of silver wire, connected to the lead, protruded from the insulation at the inner end of the metal carrier. A hole of suitable size was drilled in the skull with a trephine or dental bur to expose the dura, and the metal carrier was screwed firmly in, cutting its own thread in the bone. In experiments where the animal was to be electrocuted on the same day as the operation for implanting the electrodes, the metal carriers were of brass with a $\frac{1}{16}$-inch Whitworth thread, and the leads were held in place with sealing wax. Where the animal was to survive for more than one day, silver carriers with a $\frac{1}{16}$-inch Whitworth thread were used and the wires were held in with "Vinagel 118," a thermal-setting plastic (Vinyl Products, Ltd.). Two electrodes were placed about 3 cm. apart and about 1 cm. to the left of the mid-line. The posterior electrode was usually about 1 cm. in front of the nuchal crest. A third electrode was screwed in on the right side of the skull to serve as a reference "earth" for the balanced-input, push-pull, resistance-capacity coupled, amplifier. The leads were drawn under the skin to an opening in the skin of the back, using a long blunt-pointed bodkin. The same bodkin was used to position the E.C.G. electrodes under the skin. These consisted simply of insulated flexible wires with about $\frac{1}{2}$ inch of silver wire attached to the end, the soldered joint being insulated with "Vinagel 116." The silver wire was hooked into the eye of the bodkin, this was introduced through the wound on the back and pushed under the skin until its tip lay in the desired position over the right shoulder or left flank. A gentle tug on the wire now detached it from the bodkin so that the latter could be withdrawn leaving the electrode in position.

Intracranial pressure was recorded by connecting an electronic transducer-manometer to a cannula screwed into the skull. The intracranial pressure normally shows rhythmical fluctuations which reflect the pulsations in the blood-pressure. A record of intracranial pressure thus gives some information about the pumping activity of the heart. The cannula resembled the metal carriers for the E.E.G. electrodes and was fitted with a narrow-bore plastic tube obtained by pulling out the conductor from a length of insulated wire. The dura was slit open at the mouth of the cannula. The connecting tubing was taken under the skin and anchored to the harness on the dog's back in just the same way as for the E.E.G. leads. As the connection to the manometer was by an air-filled plastic tube, recording of intracranial pressure could be continued without electrical interference even during the application of the shock.

Results

Animals prepared in this way have been subjected to the routine procedure for electrocution, the current being passed, in a standard GECAM cabinet, for various periods of time. The currents and voltages actually applied to the dogs were recorded with a duplex recording milliameter. The only alterations made to the cabinet are those indicated by the thin lines in the diagram (Fig. 1). These do not materially alter the operating conditions from those used routinely. The resistance normally fitted in the primary circuit of the cabinet reduces the effect of differences in the resistances at the electrodes. For 19 dogs the average current was found to be 486 mA. ; S.D., 29 mA.

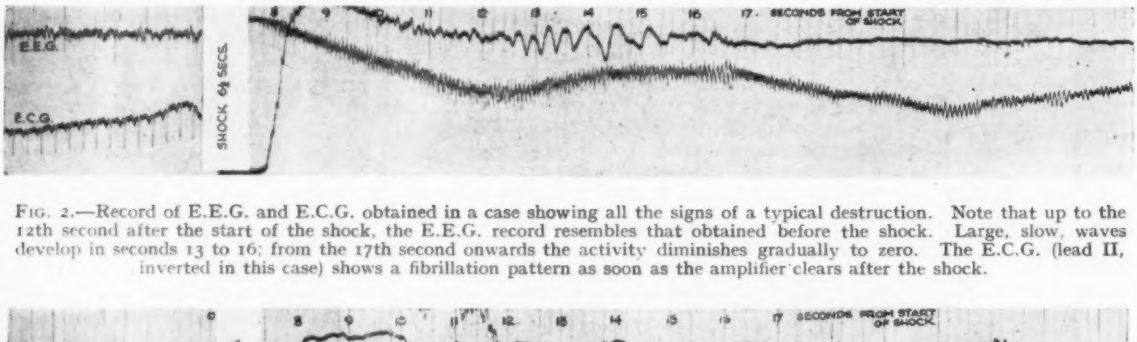

FIG. 2.—Record of E.E.G. and E.C.G. obtained in a case showing all the signs of a typical destruction. Note that up to the 12th second after the start of the shock, the E.E.G. record resembles that obtained before the shock. Large, slow, waves develop in seconds 13 to 16; from the 17th second onwards the activity diminishes gradually to zero. The E.C.G. (lead II, inverted in this case) shows a fibrillation pattern as soon as the amplifier clears after the shock.

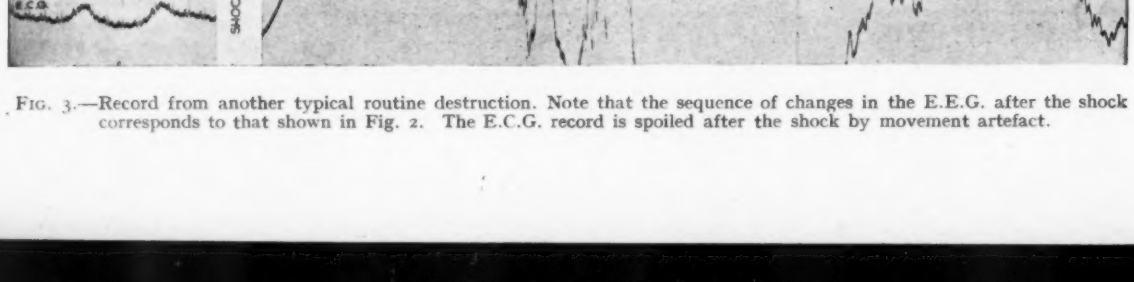

FIG. 3.—Record from another typical routine destruction. Note that the sequence of changes in the E.E.G. after the shock corresponds to that shown in Fig. 2. The E.C.G. record is spoiled after the shock by movement artefact.

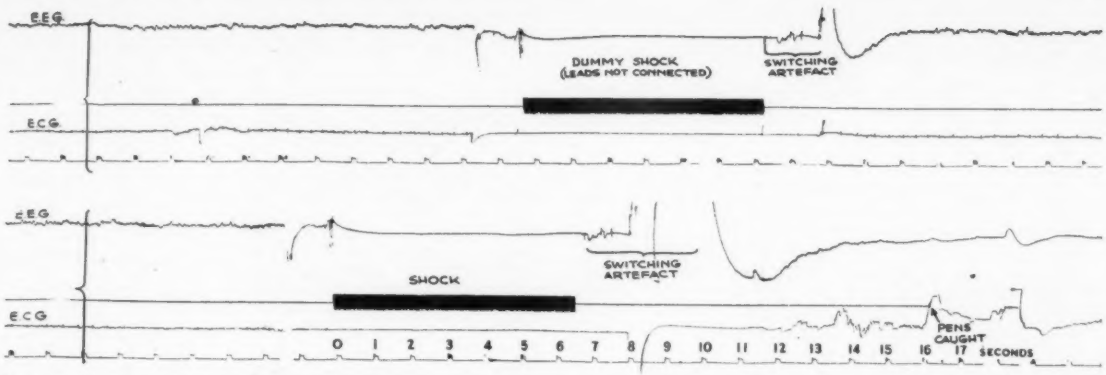

FIG. 4.—Two records obtained in succession from the same animal. In the first record no shock was given as one of the leads had inadvertently become disconnected. The E.E.G. following the lethal shock shows no significant difference from that following the dummy shock until about 16 seconds from the start of the shock, when the activity begins to diminish.

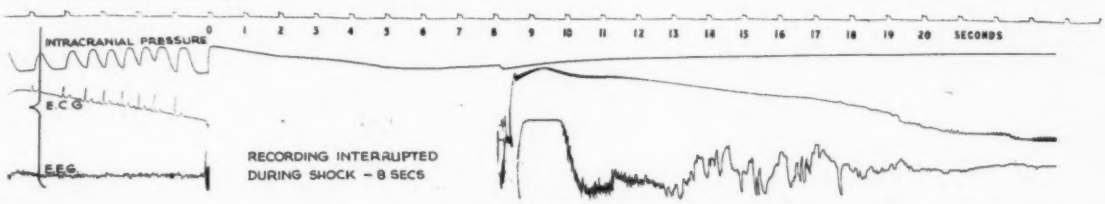
INTRACRANIAL PRESSURE
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 SECONDS
E.C.G.
E.E.G.
RECORDING INTERRUPTED DURING SHOCK – 8 SECS

FIG. 5.—Record from a case which showed increased-amplitude, fast, activity in the E.E.G. in seconds 10 to 12, preceding the phase of large slow waves. This record shows very clearly that the pulsations in the intracranial pressure cease abruptly at the onset of the shock.

As the electrocuting current would seriously interfere with the apparatus for recording E.E.G.s, this apparatus was disconnected by a special device while the shock was applied. It has been possible to obtain analysable E.E.G. records very soon after the end of the shock in 13 out of 21 cases.

If it is assumed, in conformity with general experience, that loss of consciousness is associated with changes in the pattern of the E.E.G., then we can examine the records in these experiments for signs of unconsciousness during the period just after the shock, by comparing the E.E.G. record for this period with that obtained during the presumably normal period prior to the shock. In 10 out of the 13 successful experiments no change in the electrical activity of the brain could be detected until about 12 seconds had elapsed after the current was first switched on (Figs. 2, 3, 4, 10 & 14). In one case special precautions were taken to standardise the artefacts produced by the vibrations of switching, etc. A mechanical device was constructed to carry through automatically the full sequence of switchings. When this was first tried, the animal did not receive a shock and it was found that one of the leads had inadvertently become disconnected. The fault was remedied and a lethal shock was given. The E.E.G. following the lethal shock (Fig. 4) showed no significant difference from that following the dummy shock until about 16 seconds from the start of the shock.

In the single case illustrated by Fig. 5 a phase of increased-amplitude, fast, activity appeared in the E.E.G. record just after the shock and before the onset of the large, slow, waves. Such increased-amplitude, fast, activity is also found during induction of anaesthesia with thiopentone and during the stage of light anaesthesia obtained with this drug. Sugar & Gerard (1938) observed a somewhat similar stage as one of the early effects of acute cerebral anoxia produced by arterial occlusion. It may be that in this case the animal was particularly sensitive to cerebral anoxia.

In three cases a definite seizure was seen (*e.g.*, Fig. 6) but it should be mentioned that in two of these (*e.g.*, Fig. 7) there were some signs of abnormality appearing in the E.E.G. record a second or two before the current was switched on. (*See p. 564.*)

In the cases which did not develop a fit, the changes in the pattern of electrical activity starting at about the 12th second from the onset of the shock were characteristic and led to cessation of all activity at about the 20th second.

The effect of the shock on the activity of the heart was also studied. All shocks of one second duration or longer produced ventricular fibrillation (Figs. 8 and 10). A shock lasting half a second did not produce fibrillation (Fig. 9) and did not kill the dog on any of the three occasions on which it was tried. It has been possible to obtain information about the action of the heart, even during the application of the shock, by recording the intracranial pressure through an air-filled tube of insulating material. The intracranial pressure shows marked pulsations so long as the heart is beating (Figs. 5, 7 and 10). These pulsations cease as soon as the electrocuting current is switched on. This means that the heart stops pumping at this point. This is what could be predicted from the work of Ferris *et al.*

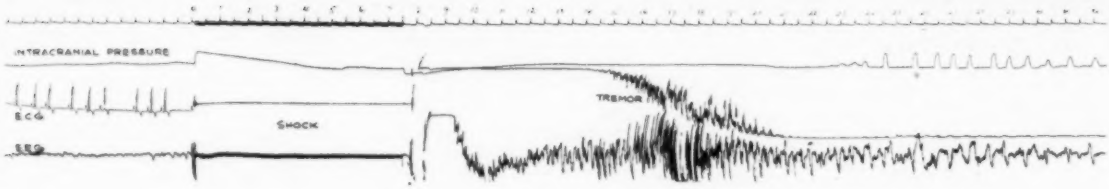

FIG. 6.—Record from a case which developed a fit. The application of the shock is indicated by a thickening of the base-line of the time trace. The E.E.G. is unmistakably different from that recorded before the shock. The E.C.G. record is spoiled by movement artefact arising during the clonic stage of the fit. Intracranial pressure is recorded with insufficient gain in this case to show pulsations derived from the heart. The excursions in the later part of the trace were associated with convulsive movements.

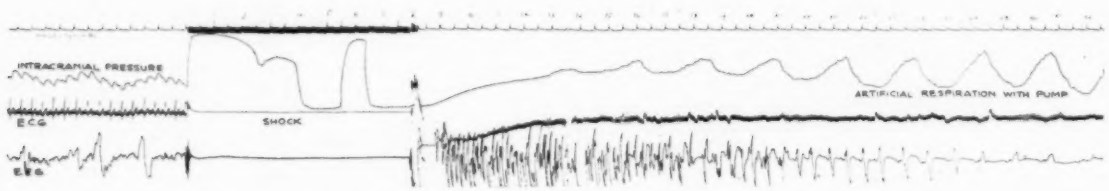

FIG. 7.—Record from another case which developed a fit. In this case the dog was paralysed with succinyl choline to reduce movement artefacts and was receiving artificial respiration from a pump. Application of the shock is indicated by a thickening of the base-line of the time-trace. The E.E.G. shows a characteristic seizure pattern after the shock but also shows some abnormally large, slow, swings in the few seconds just before the shock. Apart from the abnormalities in the portion of record shown, the E.E.G. could be classified as normal before the shock over a considerable period. Pulsations associated with the heart-beat can be clearly seen in the intracranial pressure before the shock is applied. When the current is switched on there is a sharp rise of intracranial pressure and no further pulsations are seen. The E.C.G. shows the fibrillation pattern as soon as the amplifier clears after the shock.

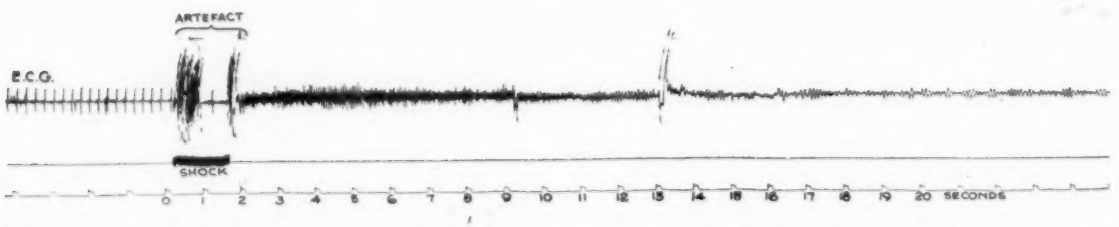

FIG. 8.—E.C.G. lead II recorded from surface electrodes. Note fibrillation pattern appearing as soon as the amplifier clears after a shock lasting only 1½ seconds.

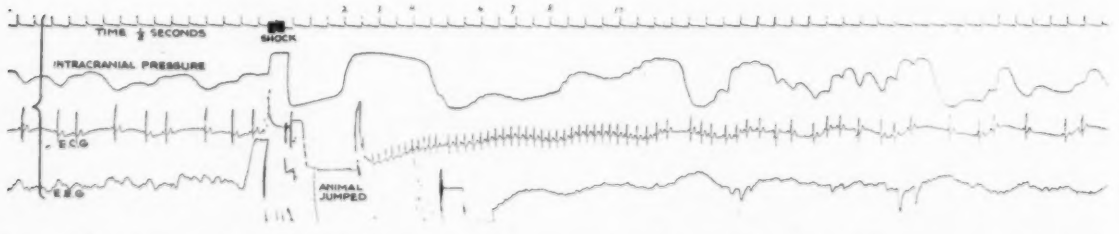

FIG. 9.—Record of the effects of a half-second shock. The dog was immobilised with succinyl choline and was receiving artificial respiration from a pump. The E.C.G. does not show any fibrillation pattern; there is a very marked increase in heart-rate. The E.E.G. before the shock shows a certain amount of slow activity which may be attributed to partial anoxia following technical trouble with the respiration pump. The change in E.E.G.-pattern resulting from the shock may be interpreted as corresponding to an increase in alertness (see also Fig. 10).

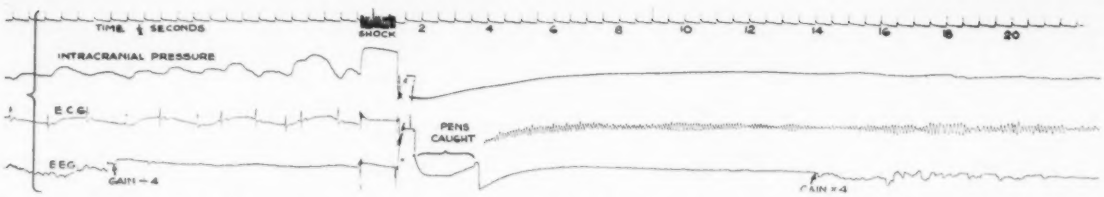

FIG. 10.—Continuation of the record of Fig. 9 after an interval of a few seconds, to show the effects of a shock lasting one sec. (dog still paralysed with succinyl choline). The intracranial pressure shows a rise at the onset of the shock, no pulse during the shock or later. The E.C.G. shows the fibrillation pattern as soon as the pens were freed at the fourth second. The gain of the E.E.G. amplifier was reduced by a factor of four shortly before the shock so that the artefacts would be less troublesome. The gain is restored at the 14th second. It is clear that there is no material change in the E.E.G. until the 16th second. From the 16th to the 20th second some slow activity appears and thereafter all activity ceases.

(1936) on the effect of electric shock on the heart, taking into account the current flowing and the disposition of the electrodes. If the heart is set into ventricular fibrillation by the shock the pumping is not resumed.

Effect of Circulatory Arrest

Further experiments have been carried out to confirm that the observed changes in E.E.G. following the electrocuting shock are those which would be expected to follow arrest of the circulation to the brain. To show the effects on the E.E.G. of a sudden reduction in the blood supply to the head, four dogs were prepared in the following way at a series of operations with the usual anaesthetic and aseptic precautions. The vertebral arteries were tied on each side at the level of the first rib; the carotid arteries were brought to an accessible position in folds of skin with tunnels underneath ("carotid loops"); electrodes were implanted in the skull, and the leads were brought out to a harness on the back. The dogs recovered very well from these operations and behaved in their normal, boisterous, friendly fashion.

On many occasions, though not on all, compression of the carotid loops now caused the animal to faint, from drastic reduction in the blood supply to the brain (Figs. 11 and 13). The record shown in Fig. 12 is of interest as it indicates the converse change from unconsciousness to consciousness. In this case the state of unconsciousness was spontaneous. The dog was lying on a warmed table and, during a delay while some technical trouble was being attended to, the animal fell asleep. The E.E.G. during this light sleep is similar to that recorded during a faint produced by carotid occlusion (Fig. 11). The dog responded to the command "Wake up!" and the E.E.G. returned to the pattern associated with the normal waking state. The character and timing of the changes in the E.E.G. following carotid occlusion (Fig. 13) correspond very closely to the changes observed after electrocution (Figs. 2, 3, 5 and 10). Comparable changes in the electrical activity of the brain following arterial occlusion in anaesthetised animals have been reported by several workers (Simpson & Darbyshire, 1934; Sugar & Gerard, 1938; Asenjo, 1939; ten Cate & Horsten, 1951, 1952; ten Cate, personal communication). The various reports agree fairly closely in the time of onset of the diminution of electrical activity.

Conclusions

It is concluded that the changes in electrical activity of the brain following routine electrocution in the GECAM cabinet are those to be expected from the stoppage of the heart and that, at any rate in most cases, there are no grounds for supposing that the shock itself produces directly any loss of consciousness in the animal.

Additional confirmation of this conclusion comes from two sources. In the routine use of the cabinet for the destruction of dogs and cats, the period of time for which the current is allowed to run is decided on the basis that if the current is switched off too soon the animal howls or screams. If this happens an additional shock is usually given. Records of E.E.G. and E.C.G. obtained while a dog was howling after a shock (Fig. 14) show that, although the heart was already in fibrillation, the E.E.G. was not significantly different from that

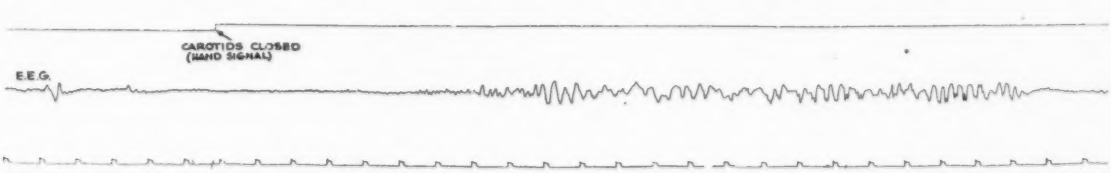

FIG. 11.—Record of changes in E.E.G. during a faint produced by carotid occlusion. Digital compression was applied to carotid loops in a dog whose vertebral arteries had previously been tied at the level of the first rib.

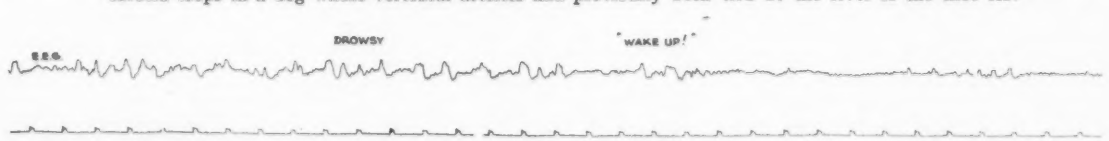

FIG. 12.—Record of changes in E.E.G. on being roused fromlight sleep. Compare this record with Fig. 11 (same animal).

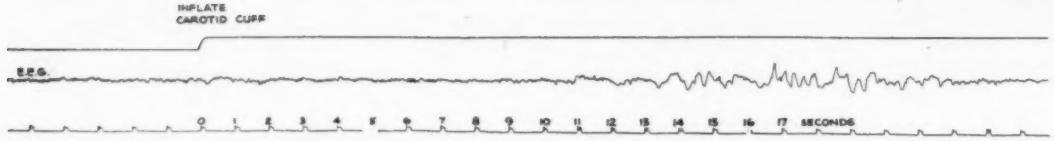

FIG. 13.—Record to show the time-relations of the changes in E.E.G. following arterial occlusion, for comparison with the changes following electrocution (Figs. 2, 3, 5 and 10). The vertebral arteries had previously been tied at the level of the first rib. The carotid loops were compressed by pneumatic cuffs which could be connected at will to a reservoir of air at a pressure of 200 mm. Hg. The pressure in the cuffs is indicated on the upper trace by a transducer-manometer.

recorded before the shock. The implication is that, if a second shock had not been given, the animal would still have lost consciousness and died in due course, as the heart had stopped pumping. A shock lasting only one second will kill a dog eventually, as it sets the heart into fibrillation.

The second confirmation comes from a single experiment in which a dog was allowed to recover from the shock. The current was switched on for only half a second so as not to kill the dog. The shock was followed by a bout of screaming lasting 26 seconds. The attitude of the dog to the experimenter and to the room where the shock had been given underwent a profound change as a result of the shock. Previously it had been a friendly animal, running inquisitively all round the laboratory. After the shock it could not be persuaded to go near the laboratory, and though it would play happily in the animal house, it stopped at once and retreated to a corner when the experimenter entered the room. There can be no doubt that this dog retained some memory of an unpleasant experience.

In the standard cabinet (Fig. 1) the dogs are electrocuted by passing current from a flexible metal collar round the neck to a metal tray on which the dog stands, or in some models to a metal shackle on one leg. The cats are constrained to stand on two trays of insulating material with their forefeet on an electrode in one tray and the hind feet on another electrode in the other tray. The current is then passed from forefeet to hind feet. It usually takes about seven seconds to be sure of killing a dog whereas a full minute is required to kill a cat. From consideration of the path of the current on the two cases, it is clear that the conclusions about the effect on state of consciousness derived from the experiments on dogs can be applied with equal force to the case of the cats.

These conclusions were reported to the Euthanasia Sub-committee of the British Veterinary Association on May 7th, 1954, and it was resolved to recommend that the use of the present model of electrocution cabinet should be discontinued forthwith. No objection can, however, be taken to the destruction by electrocution of an animal which has already been fully anaesthetised by some other means.

Summary

Dogs have been subjected in a standard cabinet to the procedure for electrocution used in the routine destruction of unwanted dogs and cats.

The E.E.G. recorded shortly after the shock indicated that, although some dogs developed a fit, in most cases no significant change in the pattern of the E.E.G. occurred until about 12 seconds from the beginning of the shock. Records of E.C.G. and of intracranial pressure indicate that the heart stops pumping when the current is switched on. Compression of carotid loops after the vertebral arteries had been previously tied at the level of the first rib usually caused the dog to faint and produced changes in the pattern of the E.E.G. comparable to those seen after electrocution.

It is concluded that the unconsciousness which precedes death in the routine procedure of electrocution with the standard cabinet is due to cerebral anoxia

(*Continued at the foot of p. 567*).

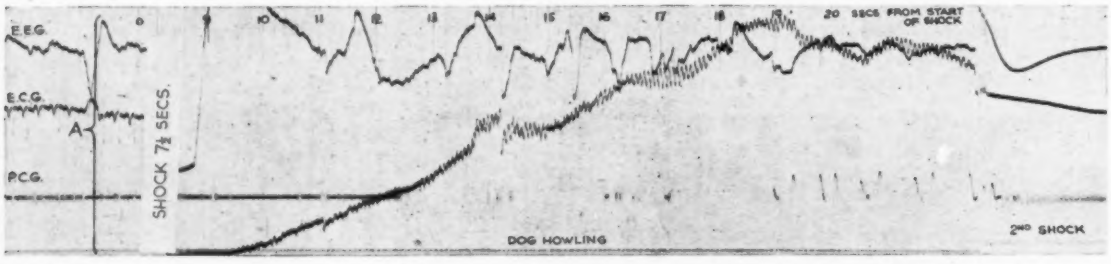

FIG. 14.—Record from a case which required a second shock. Although the E.C.G. (lead II, inverted in this case) shows that the heart was in fibrillation as a result of the shock, the dog was not killed outright but howled for several seconds until a second shock was given. A microphone had been connected in this case to an earpiece sewn to the chest wall with the intention of recording the heart sounds during the shock. This proved to be impracticable, but the phonocardiogram record (P.C.G.) serves to indicate the onset and duration of the howling. The E.E.G. is complicated by occasional large swings which are presumed to be some unexplained artefact. Between the swings, however, the record can be seen to be very similar to that obtained before the shock.

Brucellosis in Britain — Past Present and Future

A Paper presented to the Dumfries and Galloway Division, B.V.A., at Carlisle on May 27th, 1954,

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Introduction

MANY of you will doubtless be wondering why I have chosen as my subject one on which so much has been written and said by people much better qualified to do so than I can ever hope to be. But the truth is that I have had an uncomfortable feeling, for some time now, that we, as a profession, were in danger of becoming too complacent about this disease. That feeling was intensified by the results of some investigations by my colleague, G. S. Ferguson (1954), into the incidence of brucella infection in milk in the Edinburgh area, and by the realisation during travels abroad with the Gowers Committee, of the striking progress made in the eradication of contagious abortion by the Scandinavian countries in particular. Thus, in Norway, which before the war had nearly 3,000 infected herds, the disease has been eradicated at a total cost amounting to rather less than the previous annual losses from the disease. Sweden had over 5 per cent. of herds infected in 1938 but by 1953 the percentage rate was a very small fraction of 1 per cent. Denmark has rapidly reduced its percentage of brucella-infected herds from 22 per cent. in 1946 till it is now about 4 per cent., and Finland is rapidly approaching freedom from this disease which it expects to achieve within the next two years. I feel, therefore, that the time has come when we should be taking stock of our position and considering what our next step should be.

Anyone talking about brucellosis in Britain has a simple task compared with that he would have in many other countries. *Brucella suis* infection does not occur here so far as we know, nor does *Br. tularense*—though, as it is present in France, it is not impossible that we may be faced with it in our rodent population sooner or later—at least if myxomatosis is any guide! And although organisms with all the cultural characteristics of *Br. melitensis* are isolated occasionally from cows—some 18 cases have been officially reported over the last decade (Report on the Animal Health Service in Great Britain, 1952)—they do not appear to have any special pathogenicity for man; we may be excused, therefore, for wondering whether we are not dealing in those cases with some aberrant strains of *Br. abortus*. Thus, I can confine myself this afternoon to *Br. abortus*, the causal agent of contagious abortion in cattle and of a relatively mild form of undulant fever in man which, nevertheless, is probably sufficiently widespread to make it a matter of some importance. Dalrymple-Champneys (1950) has estimated that there may well be some 1,300 fresh cases in this country annually; and though the disease is seldom fatal it can cause prolonged indisposition and reduced capacity for work, which may be of some economic significance.

Contagious abortion has doubtless been with us for a long time—its importance and even its contagious nature are mentioned in some of the earliest veterinary text-books we have in the English language. But there was little official reference to its existence till about 1905 when the Board of Agriculture appointed a Departmental Committee under the chairmanship of Sir John M'Fadyean to enquire into the nature of the disease and to consider what preventive or remedial measures could be adopted. This Committee recommended, in 1910, that the disease be made notifiable, with temporary

(*Continued from p* 566).

following stoppage of the heart. There are no grounds for supposing that the shock itself produces directly any loss of consciousness in the animal.

The conclusions drawn for the case of the dogs are held to be equally valid for the case of the cats.

Acknowledgments.—Acknowledgments are due: to Professor W. L. Weipers for drawing my attention to the problem and for his close interest throughout all stages of the work; to the Dog and Cat Home, Glasgow, for the loan of a standard cabinet; to UFAW for the loan of a duplex recording milliameter; to the B.V.A. for funds to meet certain expenses; to my colleagues, Mr. A. M. Andrew and Dr. J. W. Black, for assistance with certain of the experiments.

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isolation and restrictions on the movement of animals which had recently aborted. In the light of what we now know concerning the nature of the disease it is unlikely that such measures would have been effective. But they were never put into force as they got little support from the agriculturalists. The chief objection made was that any such regulation would not only cause undue interference with dairying but would also " cause loss to the milk seller owing to the effect, which the fact that his premises were the subject of administrative action in connection with the Order, might have on his customers, who might be led to believe that a disease infectious to man existed on the premises " (Board of Agriculture and Fisheries Annual Report, 1913). This was, of course, one of those cases where the customer was right ! But we must remember that nearly another decade was to pass before Alice Evans (1918) was to draw attention to the close resemblance between the *Micrococcus melitensis* discovered by Bruce and the *Bacillus abortus* of Bang ; and until Bevan (1921), in Rhodesia, was to draw attention to the likelihood that *Br. abortus* was actually producing undulant fever in man. Although ultimately the general restrictions recommended were embodied in legislation without making the disease notifiable (Epizootic Abortion Order, 1922), this has, as you know, remained largely a dead letter and, until about 10 years ago, reliance was placed largely on live vaccines. These were doubtless of value when used on non-pregnant animals in infected herds but their use was not extensive and probably had little effect on the general incidence of the disease.

Unfortunately, we do not know accurately what that incidence was. The Economic Advisory Council's Committee on Cattle Diseases reported in 1934, on apparently rather inadequate evidence, that the incidence in cattle was probably about 40 per cent. But the position was undoubtedly bad, for Beattie (1932) had shown that more than a third of retailed milk samples in Edinburgh were infected with viable brucella germs ; and Lovell & Hill (1940) found from a survey of 335 herds in England and Wales that roughly 10 per cent. of calvings ended abnormally.

S.19 Vaccine

In 1942 we saw the introduction of S.19 vaccine to this country and in 1944 there was launched officially the Calf Vaccination Scheme which in 1952 dealt with 370,667 animals although many more animals were doubtless being vaccinated since the total output of vaccine from Weybridge in that year was about 780,000 doses. Even then the proportion of the bovine population which was being vaccinated was not large, as the number of bovines under one year old in the country was about 2,000,000, of which, if the 1951 Agricultural Statistics are any guide, at least 70 per cent. would be females. Thus only about a quarter of the female calves in the country were being vaccinated under the official scheme—or about 20 per cent. in England and Wales and 40 per cent. in Scotland. This is obviously not good enough and will have to be greatly extended if we are to make progress towards eradication. That brings me to my next point—we obviously want to get more calfhood vaccination but is that by itself enough ?

Now there is no doubt about it that S.19 vaccine is a good vaccine, although Gordon (1953) reported at Stockholm last year that in recent experiments at Compton they had only succeeded in getting a protection rate of the order of 40 to 50 per cent. ; this contrasted markedly with earlier results from which they had become accustomed to expect S.19 vaccine to protect about 80 per cent. of vaccinated cattle against the same large dose of infective organisms. We have, however, a considerable weight of evidence, cf. Lawson (1950), of a definite decrease in the incidence of abortions following the systematic use of S.19. This seems to be reflected in the experience of many general practitioners who confirm that clinical abortion is now comparatively rare. It is not surprising, therefore, to find Stableforth (1954) claiming that brucellosis has now ceased to be an important problem in this country.

I wish to suggest this afternoon, however, that the position, though undoubtedly considerably improved, is not one which we can regard with the complacency that such remarks seem to imply. It was the general belief, and doubtless is still the official view, that by the widespread use of S.19 we could reduce the incidence of brucella infection in this country to the stage when we could embark with confidence on an eradication policy. But can we really say that we are making anything like the same progress in eradicating brucella infection that we appear to have made in controlling clinical abortion ?

Progress Analysed

I am not at all sure that we can. In a recent survey, using the Abortus-Bang Ring test on bulk samples from some 370 herds supplying the greater part of the milk to the City of Edinburgh, Ferguson found that nearly 60 per cent. of the producers supplying over 40 per cent. of the City's supply were sending in milk which gave a positive ring test and, therefore, contained a considerable concentration of agglutinins to *Br. abortus*. Doubtless some of this might be explained by the persistence of agglutinins in animals vaccinated as adults ; but that cannot be the whole story for a survey of 256 individual samples taken by sanitary authorities for routine guinea-pig inoculation in the course of tuberculosis control showed that at least 10 per cent. contained viable brucella organisms. Ferguson's figures are supported by those given more recently by Stableforth, who stated in a personal communication that an examination of 3,108 bulk milk samples by Veterinary Inspection Officers had revealed 51·9 per cent. positive to the ring test and 18·8 per cent. positive in guinea-pigs. It is not surprising, therefore, to find that there is no sign of any decrease in the incidence of the disease in the human population. The figures given by Dalrymple-Champneys for reported confirmed cases taken with those he reported recently in the discussion of Dr. Stableforth's paper shows the average for the period 1945–53 to be almost identical with that for 1930–44. It is, of course, true that these form only a small and possibly very variable proportion of the total cases which have been estimated as being over 400 per annum (Wilson, 1932) and possibly nearer 1,300 (Dalrymple-Champneys, 1950), and it may also be that improvements in diagnosis are masking a real decrease in the incidence of undulant fever. But I do not think we ought to lay too much stress on such arguments. There may well be something in the remarks of Smith

(1951) who, following a review of the undulant fever position in N.E. Scotland from 1929 to 1950 questioned whether the general improvements in milk hygiene and the widespread use of S.19 vaccine had in fact reduced the infection rate in the milk supply. When I add that we still hear of puzzling breakdowns due to brucella infection in vaccinated herds, and that both the number of samples coming in to our Bacteriology Department for examination for *Br. abortus* infection, and the percentage which prove to be positive show no sign of declining (Taylor), I think you will agree with me that there is little ground for complacency and that it is really time we started asking ourselves—"Where do we go from here?"

Now there is considerable evidence to show that S.19 can be used to reduce the degree of infection in a herd, *e.g.*, Lawson & Dalling (1949) and, therefore, it may be the case that, although a large number of herds are still infected, the proportion of animals actually infected in these herds is less than it was in 1940 though I do not think we ought to depend too much on that possibility. Even one infected animal in a herd can be a danger to its fellows should vigilance cease, and, if it is excreting infected milk, a danger to the human population as well. I feel, therefore, that however correct the decision to embark on a widespread but uncontrolled scheme of vaccination may have been in the war-time circumstances of the early 1940s, it may have encouraged the tendency to regard vaccination solely as a way of reducing financial loss—a way which has tended to become accepted as a substitute for efficient sanitation and good husbandry. For, good vaccine as S.19 undoubtedly is, it has the same inherent defect as most vaccines in the veterinary field—it tends to engender an undue sense of complacency in the users. This may lead to neglect of ordinary sanitary control measures, thus lessening the effectiveness of the vaccination policy; at the same time it may induce acceptance of a level of disease which, although small in comparison with the abortion storms we used to encounter, may yet be of considerable economic and public health significance. This has been the experience of other countries when they relied on vaccination alone. What I have said is an indication that the same may be happening here.

Progress in Scandinavia

It may, therefore, be of interest and possibly of some value to discuss the reasons for the rapid progress in the Scandinavian countries compared with our own. It certainly was not necessarily due in any degree to their problem being insignificant. For example, Denmark, which is now almost free, had some 25 per cent. of its cattle affected in 1938; so it had quite a formidable task and progress had been amazingly rapid in spite of the set-backs of the war. There are, of course, a number of factors contributing to this rapid success. One must recognise that in the Scandinavian countries agriculture looms larger in the national economy than in ours, so that it was doubtless easier to persuade their Governments to sponsor disease eradication measures. We must give, also, considerable credit to the support and enthusiasm of the Farmers' Co-operative Organisations so prominent in those countries. Whatever may be the economic advantages and disadvantages of such organisations they certainly have proved their worth in this connection; they not only stimulated the farmers to unite in tackling their animal health problems but were also both able and willing to bring pressure to bear in the form of financial and other penalties on those of their members who refused to co-operate or who lagged behind in their eradication programme. While these factors are by no means negligible, I think we must also appreciate that even technically these countries have been somewhat ahead of us. Thus, practically from the start, they made eradication their aim. They did not wait so long as we are doing for the incidence to fall but started testing and elimination of reactors alongside their calfhood vaccination at a very early stage; they realised, also, more than we appear to have done the vital importance of hygienic measures of disease control if the best results were to be obtained from vaccination; and therefore they laid great stress on the isolation of reactors, especially isolation at calving. This, in the Danish view, was the important factor in the success of their work in combating brucellosis. The risk of transmission of infection, they believe, is largely limited to the period of calving (or abortion)—from three or four days before to about two weeks after—when as much as 90 per cent., or even more, of the infective matter is discharged. This massive spreading of infection, they hold, must be avoided by isolation of the animals concerned if vaccination is to have a reasonable chance of success. Every reacting animal should be isolated no matter whether it aborts or calves prematurely or at term; and any animal which aborts or calves abnormally should be isolated even though it has never given a positive reaction before. If every animal reactor or otherwise can calve in isolation, so much the better. With calving isolation, plus calfhood vaccination, the risk of infection spreading through the herd is greatly diminished and eradication becomes practicable. In order to ensure attention to this vital factor of calving isolation it was made an indispensable condition for financial assistance towards the costs of eradication.

They were also prompt in adopting the milk ring test (A.B.R. Test) to simplify and speed up the work. This test, which was first introduced in 1937, is, as you know, essentially a rapid agglutination test carried out on milk. It has proved extremely valuable as a simple, accurate, and time-saving method of finding which herds are probably infected with brucella organisms. Even in individual animals it is remarkably accurate, as it correlates to the extent of at least 94 per cent. (and probably nearer 97 per cent.) with the blood agglutination test); and there are suggestions that it may even be of some value in distinguishing between infected and vaccinated animals, though the evidence on this latter point is still somewhat conflicting. I am quite satisfied that it is because they have exploited to the fullest extent the useful qualities of both milk and blood tests, together with vaccination and sanitary control measures, that these countries have made infinitely faster progress than anyone would have believed possible.

The Danish System

The Danish system of eradication has been briefly this (Nielson, 1953). When a Co-operative dairy took

up the task of combating brucellosis in its area, all producers supplying the dairy had their bulk milk sampled and subjected to the ring test every four months at first, though now the interval has been shortened to three months. The infected herds thus revealed were submitted to blood tests twice a year on all animals over one year old. The first step in the eradication of the disease on those farms took the form of S.19 vaccination of all calves at the age of five to seven months—only in exceptional cases was the vaccination of older stock allowed because of the difficulty associated with persistence of reactions to the agglutination test. Along with this went group isolation of reactors, and especially calving isolation, on which great stress was laid. As far as possible reactors were kept in a group at one end of the byre—preferably adjacent to the exit of the dung channel ; and according to the conditions on the individual farm an agreement was reached with the veterinary surgeon as to a suitable place where the reactors could be isolated from a few days before calving (or abortion) until about two weeks after. The Danes insist that a safe calving isolation can be found on most farms. On the very large farms where separate calving boxes and separate attendants were available they were, of course, used ; and on the farms with very small numbers of animals isolation in the stable or even in a pig sty was sometimes possible. But on the medium-sized farm good results were obtained even with the isolation " ward " in the same cowshed as the dairy herd with only a low partition between, provided two points were attended to :—

(*a*) There was no direct passage between the two sections, so that the excreta from the infected group did not pass into the main part of the cowshed but was collected and disposed of separately.

(*b*) Separate tools and utensils were used for the two sections, and in particular footwear was cleaned carefully before leaving the isolation section.

Diagrams showing typical isolation arrangements adopted are reproduced (Fig. 1) by kind permission of Dr. F. Weldike Nielsen, Director of Veterinary Services, Copenhagen. On no account were animals allowed to graze in the period immediately following abortion ; reactors which calved normally were allowed out to graze on an isolated pasture to which other cattle were not allowed access that year.

Such an arrangement could obviously not be fool-proof any more than vaccination itself is, but the important thing is that the two in combination proved very nearly so. For while vaccination can make little headway against mass infection it can give sufficient protection against the reduced risks associated with calving isolation of reactors even though this is not perfect.

When two successive blood tests had shown that the spread of infection in the herd had ceased, elimination of reactors commenced on a test and slaughter basis and was fitted into the herd economy with some financial compensation for the inevitable losses associated with such a policy. At the same time all cases of abortion had to be reported to a veterinary surgeon and examined at the State's expense. When a herd showed no reactions to the ring test on three successive milk samples taken at intervals of about four months, and three to six months after the last milk test had no blood reactors

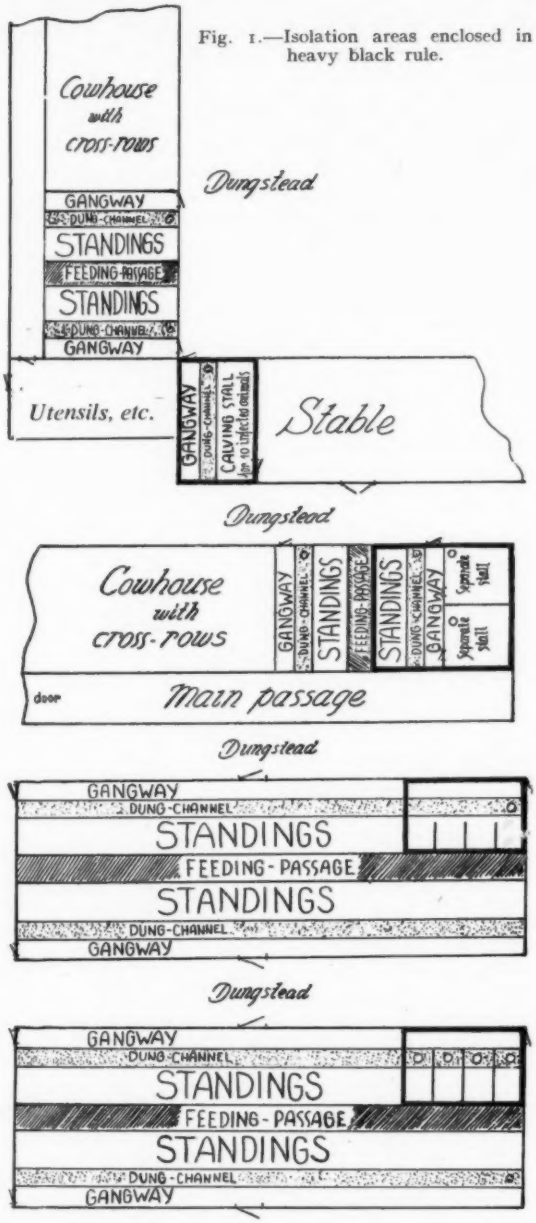

Fig. 1.—Isolation areas enclosed in heavy black rule.

amongst all the animals over a year old, then the herd was registered as free from contagious abortion ; and animals were allowed to be sold from it with a certificate of freedom provided they had passed a blood test within the preceding three months. Thus a source of guaranteed abortus-free cattle became available for replacements elsewhere. One other feature is worthy of notice—dairies adopted a reasonable time limit for getting herds free of reactors, after which in the case of any herd which was still infected approximately a

(*Continued on p.* 571).

penny per gallon was deducted from the milk cheque till the herd was free—a very direct incentive to the owner to get on with the job !

The Lesson of Experience

Now are there any lessons we can learn from all this ? I would suggest the following :—

Firstly—boldness pays ! While we should never underestimate a problem we should not overestimate it either. As our Danish colleagues have found, the solution may prove simpler than was anticipated.

Secondly—more vaccination. It is obvious that we must have much wider use of S.19 in calfhood vaccination. The cost is negligible, the benefits in preventing abortion, if it is done correctly, undoubted, and I would emphasise that we have a duty as a profession to encourage its use and publicise it amongst our clients as much as possible.

Thirdly—vaccination is not enough. We should encourage farmers not merely to vaccinate but also to limit the spread of infection in their herds by isolation of reactors at calving time. Ideally this should be done on the basis of the blood test but, in view of the high correlation between blood and ring tests, I feel that good results could be obtained by the use of the latter which is, I am sure, within the capabilities of any veterinary surgeon. The test is simple—it involves merely mixing 0·05 ml. (one drop) of a suitably stained (*e.g.*, haematoxylin) brucella antigen with 1 ml. of well mixed and creamy milk contained in a narrow test tube. The tube used should be such that the column of milk is about 2 cm. deep. The test is read after incubation at 37° C. for 40 to 60 minutes. In the field the incubation could be effected in a thermos flask, an insulated simple water bath, or even in the waistcoat pocket. A deeply coloured cream layer lying on top of a completely white or only slightly tinted milk column indicates the presence in the milk of agglutinins to brucella at high concentrations. The following typical reactions may be recorded and are depicted in the photographs in Fig. 2.

The test may be carried out on bulk milk samples or on the milk from individual animals and is not seriously affected by the stage of lactation or by the presence of mastitis, but the milk must be in the fresh state and free from preservatives. Its use could greatly increase the effectiveness of calfhood vaccination and make it possible for farmers, should they so desire, to get rid of infection completely from their herds.

Conclusion

We should proceed to stimulate the demand for State action to set in operation a scheme for certification of brucella-free herds and later of brucella-free areas. I am well aware of the objections that will be raised when we mention such a project. How, it will be asked, could we possibly do so when we are so busy with tuberculosis eradication ? Well, other countries with equally difficult problems have succeeded in eradicating both diseases practically simultaneously, so why should not we ? And there are areas, of course, where tuberculin testing is falling off with the progress of attestation, so a brucellosis eradication programme might well be not only feasible but also welcome to members of the profession as well as to the community. It is, of course, only all too easy to find excuses for inaction—but difficulties are there to be overcome ; they can be overcome and I submit that they must be overcome in the interests of agriculture and of public health, to say nothing of our own professional self-esteem. But I am equally convinced that they are unlikely to be tackled vigorously until there is a strong and united demand from the rank and file of the profession—as was the case with tuberculosis eradication some 30 years ago. It is to the practitioner in the field and the influence he has with his clients that we must look for progress—which is the main reason why I had the audacity to come and talk to you on this subject to-day.

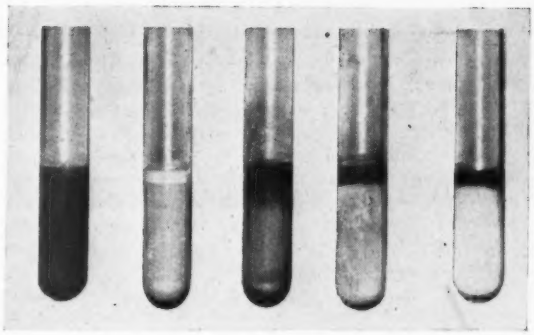

FIG. 2

Tube No. 1. Unincubated milk and antigen mixture.

Tube No. 2. —, negative : white or only slightly coloured cream layer on a deeply coloured milk column.

Tube No. 3. +, doubtful, or weak positive: the cream layer is distinctly coloured forming a ring, but the milk column remains deeply coloured too.

Tube No. 4. ++, positive: the cream layer is deeply coloured forming a distinct ring; the milk column remains slightly coloured.

Tube No. 5. +++, positive: the cream layer is deeply coloured and lies on top of a completely white milk column.

(The terms negative or positive refer to the absence or presence of brucella agglutinins in the milk sample).

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Discussion

Mr. Hector, in opening the discussion, said that there seemed to be few breakdowns with S.19 vaccine in his area. Nevertheless, he agreed that a case had been made out for proceeding in this country with a scheme of eradication on the Danish lines though he felt that it might be difficult to persuade farmers to change from the present cheap and, so far as they were concerned, apparently efficient method to a more expensive eradication policy. He suggested that attestation had made sufficient progress in Dumfriesshire to make that a suitable area for embarking on any such scheme. One point on which he would like information was the steps which had been taken to control flies during calving isolation ; he had read reports of experimental work which had suggested that flies could transmit the infection and he wondered if any special precautions had been taken. He also wondered if the ring test could be used to differentiate between brucella infection and S.19 vaccination.

Mr. Benson agreed that S.19 was a useful vaccine from the clinical point of view though he had experienced breakdowns. He wondered whether it was Professor Robertson's experience to encounter these breakdowns more frequently in older cows than in younger stock.

Mr. Edgar wondered what was the incidence of undulant fever in the Edinburgh area. Was there any sign that it was increasing or diminishing ? He thought it might be a good plan to use the samples that were being taken periodically by the Milk Records Association for carrying out a ring test survey on the incidence of infection in herds. He wondered if, following the eradication of brucellosis in cattle, there was any suggestion of an increased incidence of the disease in human beings as had been alleged in the case of tuberculosis.

Mr. Moir asked if there had been many breakdowns in Denmark while they were conducting their eradication scheme.

Mr. Campbell wondered whether Professor Robertson would lay more emphasis on the inefficiency of S.19 vaccination or on the lack of it. He thought that the general concensus of opinion was that S.19 was a very good vaccine which, if more widely used, would give the results expected of it. He wondered, in passing, if there were fewer cases of fistulous withers in the horse than there used to be. He felt that one of the difficulties in promoting any eradication scheme was the actual success of vaccination preventing abortion.

Mr. McNalty raised the question whether one should vaccinate early in life, as calves, or wait until the animals were bulling heifers.

Mr. Wharton asked how soon after calving one could expect a positive ring test to be obtained in an infected animal.

Reply

Professor Robertson, in reply, thanked Mr. Hector for his opening remarks. He agreed about the difficulty which had been stressed by both Mr. Hector and Mr. Campbell in putting across a scheme of eradication. That was where, he thought, the influence of the practising veterinary surgeon should come in. The view had been expressed that their main function as veterinary surgeons was to serve the farming community and it had been suggested that, as the farmer was satisfied, there was little need for the veterinary surgeon to do anything more. He disagreed with that view because there was always the danger, with the infection remaining about farms, that, should vaccination cease or should the farmers become careless, the position might slip rapidly back to the position prior to 1944. There was also the public health aspect to be borne in mind. They had a duty to the community to see that milk, as it left the farms, was as free as possible from diseases of animal origin which could be conveyed to the human population. He felt that, if veterinary surgeons stressed to their clients these two dangers of lingering infection, it should be possible to persuade them to consider embarking on a more thorough eradication policy.

He agreed with the speakers that S.19 was a useful vaccine in spite of the breakdowns. He had encountered these in various age groups with a tendency probably for them to be more frequent in older animals. Mr. Edgar had raised the question of the incidence of undulant fever in the Edinburgh area. This, of course, was not a notifiable disease and, moreover, as the bulk of the milk was pasteurised, the disease was not likely to be a serious problem there. While he agreed that use of the samples obtained by the Milk Records Association would give a wider picture of the incidence than had been obtained so far, he doubted if the information forthcoming would warrant the expenditure and effort involved.

In reply to Mr. Moir, he understood that there had been breakdowns in Denmark particularly in the earlier stages but he could not give any details. There had been no suggestion that the eradication of brucellosis in cattle was leading to an increase of the infection in man, nor was there any sound reason for thinking that was likely to occur. He agreed with Mr. Campbell that a good deal of the present unsatisfactory position could be ascribed to insufficient vaccination ; but he would remind them that it had been the experience of other countries that calfhood vaccination alone was not the complete answer to the problem. He felt that they must pay attention, therefore, to the efficiency of their vaccination policy as well as to the amount of vaccination being undertaken. He would not like to say anything about the incidence of fistulous withers ; certainly the condition seemed to be rare, but then so were the horses!

He would agree with Mr. McNalty that it was more efficient to vaccinate when the animal was older since immunity was then likely to persist longer. On the other hand they must keep in mind the fact that such a procedure would inevitably lead to complications in the event of an eradication policy being adopted. The Scandinavian experience had been that they had to discontinue adult vaccination if they were to succeed with eradication.

He had no knowledge of any specific fly control measures being adopted in Denmark in connection with the eradication policy. There had been claims that the ring test could be adapted to differentiate between infected and vaccinated animals but the evi-

(*Continued at foot of col. 1, p. 573*).

CLINICAL COMMUNICATION

Fatal Anaemia in Poultry Caused by a Heavy Tick Infestation

J. M. S. LUCAS
Veterinary Research Officer, Animal Health Research Centre, Entebbe, Uganda

Subject

A small flock of mature poultry containing five Rhode Island Red hens and one cockerel, 11 Black Australorps and one cockerel, two native cross-breed hens and two cockerels, and two Muscovy type ducks.

History

The poultry were contained in a wired run 9 by 11 yards in which was a small pen raised off the ground on legs. The pen contained four nesting boxes. The run had been in constant use by poultry during the previous two years. Hens and ducks as they were used for the table were replaced with other mature birds. The supply of replacements was from dispersed areas in Uganda. The centre part of the run was bare of grass, though some was growing against the wire at the edges. It was the custom to throw the food, consisting of household waste, on the bare ground. Outside the run was pasture on which sheep were grazed.

The boy who looked after the poultry had reported two deaths during the previous 14 days and egg production had fallen from eight or nine a day to nil. On the day a visit was requested one more hen had died.

Examination

There was no carcase available for *post-mortem* examination. The flock had a dull and unkempt appearance, with muddy and ruffled feathers, and although it was a hot day the majority were huddled together in a corner of the run. The comb and wattles of many of the birds were very pale and the eyes watery. Some were almost bald of feathers on the head and neck, and others were losing feathers in this area. The birds were caught and examined individually.

The " bald-headed " hens were found to be carrying a very heavy infestation of ticks on the head, especially round the eyes and blocking the external orifice of the aural canal, and continuing to about mid-way down the neck on the dorsal aspect, as shown in the illustration.

Haemoglobin estimations (100 per cent. = 14·5 grammes per 100 c.c.) were made (Tallquist scale) and seemed roughly to be related to the apparent density of tick infestation on individual birds. Seven hens with no ticks showed 11·6 grammes Hb ; 12 with a moderate infection 5·80 to 8·70 grammes ; and four badly infested only 4·35 grammes. The ducks were not infested and were not estimated.

One of the heavily infested hens, a Black Australorp, was removed to the laboratory for a more detailed examination. Haemoglobin estimations were made on this hen in the laboratory using the Sahli haemoglobinometer which gives a more accurate result than the Tallquist scale. On arrival the haemoglobin reading was 4·93 grammes and red blood cell count 1·2 millions per c.c. (Wintrobe gives 10·3 grammes haemoglobin per cent. as the normal for the domestic fowl, and a red blood cell count of 2·81 millions per c.c.). A tick count showed 2,080 feeding ticks which were all confined to the area of the head and neck. This figure was made

(*Continued from p.* 572).

dence at the moment was somewhat conflicting. The test could be expected to become positive as soon after calving as the blood test and indeed there was some evidence to suggest it might appear earlier.

In conclusion he would say that he felt the discussion that afternoon had been most gratifying and had focused attention on many points which warranted further consideration if the present somewhat unsatisfactory state of affairs was to be remedied.

up of adults approximately 85 per cent. ; nymphs 12 per cent., and larvae 3 per cent. A few lice were found in the soft feathers around the tail and cloaca.

Diagnosis

An acute blood-loss anaemia caused by feeding ticks. A representative sample of 81 ticks included larvae, nymphs, and male and female adults. This collection included *Haemaphysalis hoodii* (45 ♀, 22 ♀, 11 nymphae and one larva), *Rhipicephalus simus* (1 ♀) and *Rhipicephalus appendiculatus* (1 ♀).

Treatment

The head and neck region of all birds in the run was dipped in a 1 in 100 Coopertox solution (a chlorinated camphene preparation manufactured by Cooper, McDougall & Robertson), and the poultry removed to a fresh run. After five days each member of the flock was sprayed all over with Coopertox, 1 in 250. In spite of the high concentration used at the first dipping no ill-effects were noticed.

Spraying was then repeated every seven days. The flock became clear of ticks after five treatments and was put on more clean ground. The Black Australorp that had been removed to the laboratory was dipped and sprayed at the same time and with the same concentration of Coopertox as the main flock.

Results

Haemoglobin estimations (Tallquist scale) were made in the flock after 12 days' treatment and showed a range between 7·5 and 11·6 grammes and again after 28 days when the average was 10 grammes. The Black Australorp hen which had been isolated at the laboratory showed an initial fall in haemoglobin (4·3 grammes) on the day after it had been dipped ; blood examinations over the following three weeks showed a steady rise from 4·35 to 11·78 grammes haemoglobin (Sahli) and the red blood cell count rose from 1·2 millions per c.c. to 2·85 millions.

Discussion

Infestation of fowls with *Haemaphysalis hoodii* has been reported by Tendeiro and of the quail by Walker. There appears to be no record of *Rhipicephalus simus* on poultry specifically. The absence of literature on the subject suggests that deaths in poultry due to anaemia caused by ticks are not common. It is not thought that *Rhipicephalus simus* or *Rhipicephalus appendiculatus* were present in a sufficiently large number to influence the anaemia. Infestation of birds in the tropics by ticks may be uncommon to judge by the lack of reports though this may be an apparent rather than a real phenomenon.

Acknowledgments.—I wish to acknowledge the assistance of Miss J. B. Walker, of the East African Veterinary Research Organisation, in identifying the ticks. My thanks are also due to Mr. Salthouse of the Medical School, Makerere College, who took the photograph.

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Current Literature

ABSTRACT

Experimental Infection with *Mycobacterium johnei*. I. The effect of a low calcium diet on the disease in goats. *J. comp. Path.* (1954). **64.** 102.

From time to time it has been suggested that dairy cattle grazing on land rich in calcium are less prone to become clinical cases of Johne's disease. This paper details small laboratory trials to determine the effect of a diet, deficient in calcium, on the course of the experimentally induced disease in goats.

Comparable groups of kids containing equal numbers of animals were maintained either on a calcium deficient or on a supplemented diet. In the first two experiments infection was by repeated dosing with scrapings from infected bovine intestines. The first experiment (10 kids) was terminated as there was no significant drop in the serum calcium levels in animals fed a diet of hay, flaked maize and bran. In the second experiment (eight kids), when a diet of hay, flaked maize, oats and bran was fed, three of the four kids in each group died within five months. None of the deaths was due to Johne's disease. The surviving kid on the deficient diet was killed after 39 weeks and the comparable control after 41 weeks when the latter was clinically affected with Johne's disease. In both these animals *Myco. johnei* was cultured from the liver and from certain lymph nodes.

In the third experiment in which the diet was hay, flaked maize and crushed oats, infection was a combination of oral drenching of gut scrapings and intravenous inoculation of culture. Two of the eight kids on this experiment died from coccidiosis six to seven weeks after infection had been completed. As both were in the low calcium group, the balance of the experiment was restored by transfer of one normal control to the deficient diet. The animals remaining were killed in pairs approximately 28, 37 and 40 weeks after infection. The last control kid to be killed had become a clinical case of Johne's disease and two of the kids on deficient diet showed symptoms of bone weakness and dystrophy. Cultural examinations of intestines, organs and glands were uniformly positive for both groups of animals.

The experiments failed to demonstrate any obvious effect of the lowered calcium intake but it is pointed out that the four goats in the control group had calcified necrotic lesions in the mesenteric gland but that similar lesions were absent in the animals on a low calcium diet.

J. S. P.

REPORT

Annual Report of the Department of Veterinary Science and Animal Husbandry of Tanganyika for 1952.

Mr. E. C. S. Dawes, Acting Director, in this report has given in some detail an account of the many and varied activities of a department which is concerned not only with measures of disease control and prevention but with the equally important measures of full animal productivity and utilisation.

The failures and disappointments that have been encountered, the snags, the invariable accompaniment

of all pioneering work in Africa, that have had to be overcome in the work of initiating and conducting the many schemes of livestock development and the success which has attended these efforts give proof of the wisdom of leaving this work to the Veterinary Department of the Colony. Vast as this section of the activities of the department has been it has not, however, been allowed to interfere with the more legitimate work of disease control and prevention. The preventive measures which have been carried out on a large scale over many years have their epitaph in the freedom of the territory during the year from any major epidemics of animal disease.

The effective control of rinderpest, in itself a vast undertaking, has been maintained, a work which involved during the year 1,255,389 inoculations.

Of the department's efforts to rid the territory of contagious bovine pleuro-pneumonia, that serious scourge of African livestock, it can now be written : " the concerted effort to rid the country of bovine pleuro-pneumonia by clearing up the three remaining quarantine areas in the Northern Provinces continued with such good results that 1953 may well write finis to this scourge." In one quarantine area, where active cases of the disease were occurring, all remaining cattle were given the new avianised vaccine prepared at Kabete laboratory. There was no reaction to this vaccine and no mortality. The mildness of the results has made the vaccine very popular with native stock owners. In the past the serious obstacle to the widespread use of pleuro-pneumonia vaccine was the violent reactions which too frequently followed its use.

In all 184,849 cattle were inoculated with this vaccine.

The incidence of tick-borne disease remained high, and in some provinces these diseases caused heavy mortality.

East Coast fever, in the solidly enzootic areas, caused a calf mortality of from 50 to 100 per cent.

In the measures against E.C.F. special mention is made of the progress of the Iringa dipping scheme. Forty-seven tanks have been erected and immersions now number about 400,000 a month, or over 3,250,000 a year. Out of this large number only four deaths occurred which could be attributed to dipping.

Cases of piroplasmosis were treated with pirevan but its high cost prohibits its wide application.

Heartwater caused heavy losses in one area, and in one Government farm rickettsia were found to be the cause of ophthalmia in calves.

Encroachment of tsetse fly has been reported from all provinces, with an increase in the incidence of trypanosomiasis. Infected animals were treated with Dimidium bromide at special centres. Several cases of liver damage occurred as a result of this treatment.

Anthrax gave little concern during the year. On European farms annual vaccination is a routine measure.

Tuberculosis varies widely in incidence throughout the territory. In one province the disease accounted for 25 per cent. of all carcase condemnations. Out of 1,054 cattle tested 10 gave a doubtful reaction, and the existence of non-specific infection was established.

Rabies was confirmed in five dogs in Tabora township and 140 dogs were given the Flury strain of avianised vaccine. About 50 people received antirabies treatment.

Foot-and-mouth disease is endemic and mild in nature. A more virulent form did appear, however, among young stock. Internal parasites caused heavy losses and these infections are now a major disease problem.

Bovine malignant catarrh appears annually in Masailand during the rains in areas where wildebeeste congregate for the calving season, *i.e.*, from February to April. Losses occur each year.

In sheep and goats helminthiasis was particularly prevalent and an association of mineral deficiency with the disease is suspected. Contagious pustular dermatitis was also reported.

Pigs remain remarkably healthy in the country.

Poultry suffer from the usual diseases : Typhoid, cholera and pox. Tuberculosis was reported from Iringa, where, as reported earlier, there was also a high incidence among cattle.

Distemper, piroplasmosis and mange affected dogs and cats and hard pad disease occurred in one district. A feature of this last disease was that it never affected Bull Terriers or their crosses.

Livestock Research.—A large and ambitious programme of work has been planned and a beginning made to find out and develop the best breeds of local cattle for local conditions.

Breeds for beef and milk are being sought in order to supply the growing needs of local markets. Sheep, goats and poultry are also being improved.

Pasture Research.—An important part of the work of livestock improvement is the monthly analysis of pasture grasses to determine their nutritive properties in different stages of growth. Research to improve the quality of pasture is also in progress. The growth and preservation of fodder crops is also being studied and also the making of ensilage.

It may well be that the universal cultivation of improved grasses and suitable fodder crops for ensilage will prove to be the basis on which to build an improved livestock industry. Ensilage and fodder crops can also prove a means of making more use of existing stock by staving off the loss of condition during the dry season, which is proving a handicap to livestock development, and by bringing animals to earlier maturity. Better bred animals have no better chance of survival and growth under native African conditions than the present indigenous breeds; indeed, they have less, and an essential part of schemes for livestock improvement and development must be the provision of adequate food supplies.

Trade in livestock and animal products furnished yet another important activity of the department. Good work is being done in the organisation of livestock sales, the control of stock routes and holding grounds, in meat inspection, and the supervision of schemes for improved production of hides and skins and leather, and milk and dairy products. By these various means native stock owners are made to realise the value to them in hard currency of the adoption of methods of animal husbandry advocated by the department for the greater productivity of their livestock and increased value of their livestock products.

W. W. H.

Professor Alexander Robertson

NEWLY ELECTED PRESIDENT OF THE B.V.A.

IN electing Professor Robertson its President for the forthcoming year the B.V.A. has added a fresh distinction to a career already notable. Still in his middle 40s, and having been appointed Professor of Hygiene, Dietetics and Animal Husbandry at the Royal (Dick) Veterinary College, Edinburgh, at the early age of 36, the new President is widely known, both here and abroad, as teacher, research worker and practical veterinarian. His qualities have already been recognised far beyond the circle of his university and of the profession. He is a Fellow of the Royal Institute of Chemistry, of the Royal Society of Edinburgh, and of the Royal Sanitary Institute ; a member of the Council of the Nutrition Society, a member of the Agricultural Research Council's standing committee on research affecting animals, and a member of the governing body of Pirbright. Many other learned and official bodies number him among their most distinguished members, and his latest call to public service was as the only veterinary surgeon on the Gowers Foot-and-Mouth Committee.

Professor Robertson was born in Aberdeen in 1908. He was educated at Stonehaven Mackie Academy, Aberdeen University, and the Royal (Dick) College to which he was awarded a Colonial Office Animal Health Scholarship. He had previously graduated both in Arts and in Science, and at the Dick took his M.R.C.V.S. Diploma with a string of distinctions, being awarded the second Fitzwygram prize and the James Tindall post-graduate scholarship.

For two years (1935–37) he was a veterinary inspector of the Ministry of Agriculture. After a short period in the field he was transferred to Weybridge to work on vaccination in relation to bovine tuberculosis. He also carried out investigations into the specificity of the tuberculin test and into the problem of skin tuberculosis in cattle. Teaching claimed him, however, in 1937 when he was appointed Lecturer in Physiology and Biochemistry in the Royal (Dick) Veterinary College. He collaborated with Professor Dryerre in organising extensions of the teaching courses for both M.R.C.V.S and B.Sc. (Vet. Science) students, and also carried out research into problems associated with fat metabolism in sheep for which he was awarded the degree of Ph.D. of Edinburgh University in 1940. During the war years he undertook extra teaching duties, assisting in the instruction of medical and dental students in physiology and biochemistry. From 1942 to 1947 he was Executive Officer for Scotland of the Farm Livestock Emergency Service, and also acted as a Gas Identification Officer in the A.R.P. services of Edinburgh Corporation and Midlothian County Council.

Despite the incursion of the war into his academic career he had by now made his mark as a teacher and administrator of unusual capacity. In 1944 he was appointed Professor, as already mentioned, succeeding Professor R. G. Linton in his first Chair. Some idea of his vigour and practical application may be gained by quoting the following précis of his next few years' activity. He expanded and organised the teaching of the Department to bring it into line with modern concepts on the maintenance of animal health ; modified the syllabus of instruction for B.Sc. students to provide a course in Veterinary Preventive Medicine ; took over responsibility for the teaching of Animal Management in the College and also for courses in Veterinary Hygiene for degree and diploma students in Agriculture ; instituted post-graduate classes in Epizootiology and State Medicine and in Veterinary Public Health (including Meat and Milk Hygiene) for the diploma in Veterinary State Medicine.

On taking over the Department Professor Robertson started a section for routine food and toxicological analysis which now deals with many hundreds of samples per annum ; he also extended and developed the Equine Pregnancy Diagnosis Service till it is now the largest of its kind in the country.

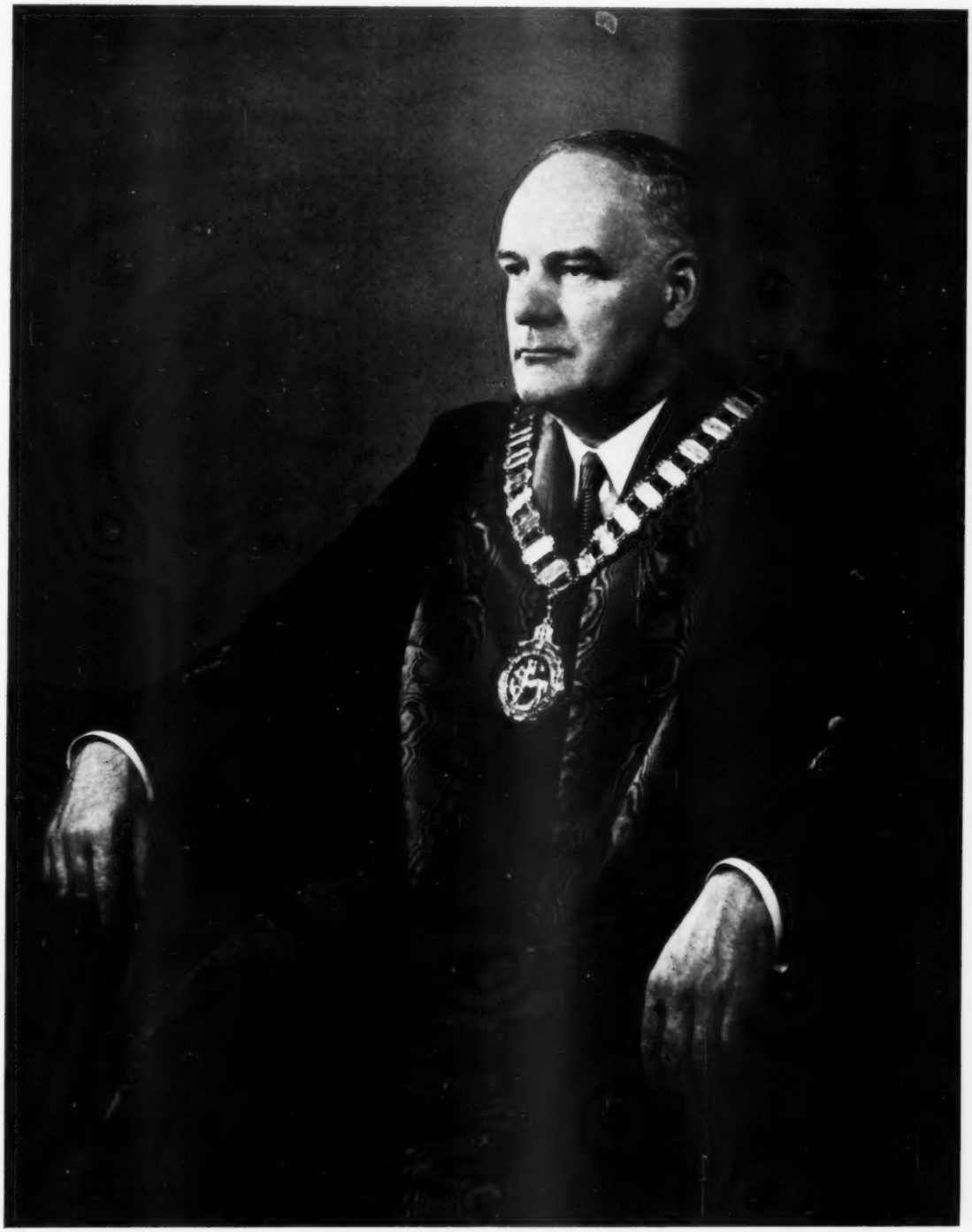
In spite of this the research side has not been neglected. Professor Robertson has conducted or supervised research into a number of subjects including grass sickness in horses, bovine hypocalcaemia, ruminant ketosis, environmental conditions in piggeries, Johne's disease vaccination and *Brucella abortus* infection.

Since 1950 Professor Robertson has been responsible for the supervision and development of the veterinary field station on the Bush Estate near Edinburgh comprising about 180 acres and carrying all types of farm livestock used for teaching and experimental purposes.

It is hardly to be wondered at, that when, in 1953, the University of Edinburgh, of which the Dick was now a part, created the William Dick Chair of Veterinary Hygiene and Preventive Medicine, they appointed Professor Robertson to it.

The new President has for many years been prominent in the affairs of the B.V.A. He was Secretary to the Scottish Metropolitan Division, N.V.M.A., from 1938 to 1945, Local Secretary to the Edinburgh Congress, 1947, and Past-President of the Scottish Metropolitan Division, Scottish Branch, and Association of Veterinary Teachers and Research Workers. He has been for a number of years a member of Council and of various committees, and is a former Chairman of the Veterinary State Medicine Committee.

Professor Robertson has travelled extensively in Western Europe, Africa and South America. He married, in 1936, Janet, daughter of the late John McKinlay, of Lanark, and has two daughters, both at school in Edinburgh. They live in Roslin, a beautiful little village on the banks of the Esk, some seven miles south of Edinburgh, where Professor Robertson takes an active part in the life of the local community as well as indulging in his favourite pastimes of gardening and hill climbing.



PROFESSOR ALEXANDER ROBERTSON, M.A., B.SC., PH.D., M.R.C.V.S., F.R.I.C., F.R.S.E.
The new President of the British Veterinary Association

In view of his past services to the Association, his addresses to Divisions, and his appearance on numerous scientific and public bodies, his personal characteristics are familiar to many members of the profession. He adds to a formidable intellect the power of cogent and lucid exposition. He has a salty wit and an impatience of pretension. He knows his own mind and expresses it with directness. He is logical in debate and firm in negotiation. In brief, the B.V.A. will have, during the coming year, a strong and able hand at the helm.

Junior Vice-President of the B.V.A.

Mr. E. Wilkinson

MR. E. WILKINSON, who was unanimously elected Junior Vice-President and President-elect of the Association at last Wednesday's Annual General Meeting, is a Midlands practitioner. A Past-President of the East Midlands Division, he has been a member of the B.V.A. Council since 1943, and has served on the Home Appointments and Veterinary State Medicine committees.

Born into a farming family in 1902, at Stapenhill, Burton-on-Trent, he may be called a native both of Derbyshire and of Staffordshire, since the family farm lay along the border, extending into each county. Mr. Wilkinson was educated at Burton Grammar School and the Royal Veterinary College, qualifying in 1924. He has said of himself, " My college career was not distinguished, but I had the privilege of graduating at or about the same time as quite a goodly number of outstanding members of the profession." This modest assessment of his own qualities would seem to be contradicted by the honour his colleagues have now conferred upon him.

During vacations he received his initiation into farming practice at the hands of the late Mr. Frank Aulton, M.R.C.V.S., of Tutbury, Staffs—a practitioner in the very best tradition of the old school. After qualifying he saw practice for short periods in Norfolk, Suffolk and at Witney, Oxfordshire, with his brother Ernest, who died at the tragically early age of 34 (in 1933).

Mr. Wilkinson started in practice on his own account at Castle Donington, Leicestershire, in 1927. Three months later he married Miss Esme Vincent, only daughter of the late Mr. and Mrs. W. Vincent, of Stretton, near Burton on-Trent. He moved to Derby in 1933 shortly after being appointed part-time veterinary surgeon for the Derby area by the L.M.S. Railway Co., on a contract basis. His work included attendance at the company's Derby horse hospital and depot (which drew its cases from some 2,000-odd work horses in the Midlands and North) and afforded a wonderful opportunity of gaining experience in heavy and light draught horse practice. In addition he carried on what he has called " a very mixed practice " for several years, working single-handed, and building up an enviable reputation.

The new junior Vice-President has taken a close interest in the work of the Association since 1925 when he joined what was then the Derbyshire Veterinary Association. It seems most fitting that, after what will by then be just over 30 years' service, not the less valuable for, being always modest and unassuming, he will lead the B.V.A. in 1955–56.

The Victoria Veterinary Benevolent Fund

A MEETING of the Council of the Victoria Veterinary Benevolent Fund was held at No. 10, Red Lion Square, London, W.C.1, on June 18th, when the following members were present : Mr. H. W. Dawes (President) in the chair, Major J. J. Dunlop, Professors R. Lovell and J. McCunn, Mr. J. N. Ritchie and Major W. H. Wortley. Mr. R. V. Thatcher solicitor) and Mr. C. W. Francis (secretary) were in attendance.

Letters of apology for absence were received from Mrs. D. I. Glover, Professor R. E. Glover, Messrs. G. N. Gould, G. P. Male, Professors W. M. Mitchell, P. E. Mullaney, C. W. Ottaway, L. P. Pugh, Major C. W. Townsend, Captain A. Whicher, Professor W. L. Weipers and Dr. W. R. Wooldridge.

Minutes

The minutes of the previous meeting held on April 7th, 1954, having been published, were taken as read and signed as correct.

Correspondence

A letter dated June 3rd, 1954, with illustrated design of a suggested coat-of-arms, which she herself had prepared, was submitted by Mrs. Bessie Hill-Owens, honorary secretary, V.V.B.F. Ladies' Guild, for the consideration of the Council.

After prolonged discussion, it was resolved :—

(i) That the Council feel it is inadvisable to accept a coat-of-arms as such on behalf of the Fund as to do so would involve the Fund in certain fees, etc., being paid to the College of Heralds, and moreover it would necessitate placing the matter before the Charity Commission for its information and necessary approval.

(ii) That it be recorded in the minutes that the design has been admired by the members of Council and that the Ladies Guild might consider the advisability of such a design being embroidered as it could then be displayed in the form of a banner at meetings of the Guild.

Investments

On behalf of Mr. H. W. Dawes, former treasurer, the secretary reported that since the previous meeting the sum of £651 2s. 8d. had accumulated in the Donations Account and that this had been invested in the purchase of £733 8s. 11d. of 3½ per cent. Conversion Stock, 1944-64. It was agreed that the action of Mr. Dawes be approved.

The following report of the accountant was read and adopted, and the secretary was instructed to express the thanks of the Council to the respective donors :—

Since the previous meeting the following donations have been received :—

	£	s.	d.
" *In Memory of Professor J. B. Buxton* "			
Professor J. McCunn			
Mr. T. J. Robinson (Past-Master of the Worshipful Company of Farriers) ... Total	4	2	0
Barber-Lomax, Mr. J. W.	4	6	2
Kenya Veterinary Association	10	6	0

Littlejohn, Miss A. I.				1	0	0
North of Ireland Veterinary Medical Association				20	0	0
Southern Irish Terrier Society (per Miss R. M. McLelland)				1	1	0
Whicher, Captain A.					10	0
" " (per Mr. A. Booth) ...				1	0	0
Collecting Boxes	£	s.	d.			
Central Veterinary Society (three meetings)	3	16	2			
Dumfries and Galloway Division ...	7	17	5			
East Midlands Division	3	0	0			
Eastern Counties Veterinary Society	4	1	2			
Scottish Metropolitan Division ...	1	6	1			
				20	0	10
				£62	6	0

Loans to Members

The President informed the meeting that an application had been received from a member, whose name he did not propose to disclose, for a temporary loan from the Society's funds and as this involved a principle —a very important principle—he would ask the solicitor for his views on the matter.

Discussion at some length then ensued, following which it was unanimously resolved :—

> That, having regard to the advice of the Fund's solicitor that under the memorandum and articles of association the Council had no power to make such a loan, the applicant be informed accordingly and that reference to this decision be included in the next issue of the annual report.

Cases

No. 254, M.R.C.V.S., aged 52. Five children. At present in-patient at a sanatorium.

A request having been received from the almoner on behalf of this member for financial help towards clothing, etc., it was agreed that the sum of £50 be allocated in this case under certain conditions to be communicated to the almoner.

No. 294. Daughter of late member. Aged 55. The Secretary reported that this case had been brought forward for review in accordance with the decision made last June. It was resolved :—

> That the present grant of £1 per week be continued for a further 12 months.

No. 295. Widow, aged 39. One daughter, aged four. Husband died November 15th, 1953.

The Executive Committee reported that following the decision of Council at its meeting held in February last, the Secretary made a special visit to this applicant on February 5th as a result of which the Committee agreed on a grant of £13 per month for three months, commencing from February 1st, 1954. The case was again reviewed in May and the allowance continued for a further two months which expired at the end of June.

It was resolved :—

> That the action of the Executive Committee be confirmed and that the grant be extended for a further three months, the Secretary being instructed to make known to the recipient the views of the Council as to the possibility of her undertaking the stripping of dogs while at her present residence where she has the necessary facilities.

No. 273. Widow, aged 45. This case having been re-opened at the special request of the V.M.A. Ireland Scrutinising Committee, it was resolved :—

> That a grant of £1 per week, as from June 1st, be made for the next 12 months, after which the case be further reviewed.

No. 298. Widow, aged 27. One son, aged two. Husband died on January 31st, 1953. £1,800 received out of her late husband's firm which has been invested. Scrutinising Committee, V.M.A., Ireland, strongly supported the application. It was agreed that a grant of £2 per week for 12 months, commencing from June 1st, be given in this case and that the Scrutinising Committee be asked to furnish a further report at the expiration of that period.

Next Meeting

It was decided that the Executive Officers should, if at all possible, arrange the next meeting to be held early in October.

PRESENTATION TO DR. B. T. FARRELLY

Dr. B. T. Farrelly, who was appointed to the post of Research Bacteriologist and Pathologist at the Equine Research Station of the Animal Health Trust soon after its establishment, is shortly leaving to return to his home town—Dublin—where he is entering into partnership in a veterinary practice.

On September 10th a short ceremony was held at Balaton Lodge, Newmarket, to mark the occasion of his departure and to present a small memento to him.

The Director, who, on behalf of the staff, presented Dr. Farrelly with a leather attaché and brief case, recalled that Dr. Farrelly was one of the first members of the research staff of the Equine Station, indeed one of the earliest research officers to be appointed by the Animal Health Trust in 1947. In those days the staff was very small and had to put up with many inconveniences, shortage of apparatus and not very suitable accommodation. Dr. Farrelly had worked loyally, efficiently and conscientiously and had played his full share in the development of the Station. On behalf of the whole staff he expressed best wishes to Dr. Farrelly for health, success and happiness in his future career and hoped that whenever it was possible, Dr. Farrelly would visit the Station where he would always be welcome.

Dr. Farrelly, in expressing his thanks, said he had been fortunate in being able to come to the Animal Health Trust to work at the Equine Research Station. He had found the atmosphere encouraging and friendly and the work interesting and stimulating; he would always look back with pleasure on the six and a half years spent at Balaton Lodge. In many ways he regretted leaving the Station, but changes were inevitable. He thanked the staff very sincerely for their kindness in giving him such a useful present.

ERRATUM

The authors have asked us to make a correction in the article " Gamma Globulin Prophylaxis of Canine Distemper " which appeared in our issue of September 18th. The fourth line of the first paragraph should read: " But in the case of distemper encephalitis, it would be unlikely. . . ." The word " encephalitis " was omitted from the original manuscript.

News and Comment

THE CIVIC RECEPTION

The first day of Congress ended in first-class style with a most enjoyable reception and dance given by the Mayor and Corporation in the Marine Spa. The air of informal conviviality which had been successfully established at the previous evening's "At Home" was much in evidence, and everyone enjoyed the dancing which continued until well after midnight.

In the course of the evening the Mayor gave a private supper party to the Officers of the Association and a number of distinguished guests; faint echoes of the "Gay Gordons" penetrated the walls and punctuated conversation otherwise decorous. Afterwards we observed some of the most learned among veterinarians to cast off the weight of their academic honours and lead the dancing with zest.

BROADCASTS

An admirable short talk about the Congress was given on the Western Region of the B.B.C. at 6.15 on Monday evening by Dr. Tribe of Bristol University. In it he indicated the scope of the papers, the now wide horizons of veterinary science, and the place of the profession in the community. At the time of writing it is believed that Dr. Tribe will be invited to give a further broadcast, one evening next week, summing up the Congress.

In the news bulletin the same evening reference was made to the speech given by the President that day at the Rotary luncheon in Torquay.

DELEGATES TO CONGRESS

During the opening ceremony official and overseas delegates to Congress were welcomed by the President in the following words "I take this opportunity of extending a very cordial welcome to those delegates who represent Government Departments and Local Authorities, not only in this country, but from overseas.

"I hope you will find our programme interesting and that you will contribute to our discussions. May I say how pleased we are to have so many friends from overseas, and particularly any who may be with us for the first time. I hope you find friendship and good fellowship to be the passport of your enjoyment."

The delegates were as follows:—

Government Departments

Ministry of Agriculture and Fisheries
Messrs. J. N. Ritchie, B.SC., M.R.C.V.S., D.V.S.M., Chief Veterinary Officer, and G. Atkinson, M.R.C.V.S., Superintending Veterinary Officer.

Ministry of Food
Mr. R. V. Blamire, M.R.C.V.S., D.V.S.M., Deputy Chief Technical Adviser.

Ministry of Health
Dr. W. H. Bradley, M.R.C.P., J.P., and Mr. T. A. Hole.

Department of Agriculture for Scotland
Department of Health for Scotland
Mr. D. S. Barbour, M.R.C.V.S., Deputy Chief Veterinary Officer.

Ministry of Agriculture : Northern Ireland
Dr. W. R. Kerr, B.SC., M.R.C.V.S., D.V.S.M., Deputy Director, Veterinary Research Division, and Dr. T. McNabb, PH.D., F.R.C.V.S.

Department of Agriculture : Dublin
Mr. P. Harnett, M.R.C.V.S., Deputy Director, Veterinary Services, Professor J. A. Nicholson, M.A., PH.D., Principal, Veterinary College, and Messrs. J. F. Timoney, M.R.C.V.S., Director, Veterinary Research, J. P. Nowlan, M.R.C.V.S., Senior Superintending Veterinary Inspector, and M. G. Hynes, M.R.C.V.S., Superintending Veterinary Inspector.

Isle of Man Board of Agriculture and Fisheries
Mr. D. W. Kerruish, M.R.C.V.S., Government Veterinary Officer.

Royal Army Veterinary Corps
Brigadier A. G. Heveningham, C.B.E., M.R.C.V.S., Director, Army Veterinary and Remount Service, and Colonel C. Holland, M.C., M.R.C.V.S., D.V.S.M.

Overseas Representatives

American Veterinary Medical Association
Lt.-Colonel Rolland O. Scott.

Australia, High Commissioner
L. N. Thornton, B.V.SC.

Australia Veterinary Association
Professor W. I. B. Beveridge, M.A., D.V.SC., and Mr. L. N. Thornton, B.V.SC.

Canada, Department of Agriculture
Dr. Orlan Hall.

Ceylon, High Commissioner
Mr. T. M. Z. Mahamooth, M.R.C.V.S.

Holland
Mr. E. de Nooy, Vice-President, Dutch Veterinary Association.

Iraq
Dr. Hasan A. Awkati, M.R.C.V.S.

Denmark
Dr. Sven O. Koch, President, Danish Veterinary Association.

New Zealand, High Commissioner
Mr. C. V. Dayus, M.R.C.V.S.

Local Authorities

Corporation of Belfast
Mr. A. McLean, B.SC., M.R.C.V.S., D.V.H., and Councillor R. G. C. Kinahan.

City of Birmingham
Mr. C. G. Allen, M.R.C.V.S., D.V.S.M.

City of Cardiff
Mr. J. H. M. Hughes, M.R.C.V.S., and Councillor W. Groves.

Corporation of Glasgow
Messrs. S. G. Abott, M.B.E., M.R.C.V.S., D.V.S.M., and Bailie G. Robertson.

Corporation of London
Mr. E. F. McCleery, M.R.C.V.S., D.V.S.M.

City of Manchester
Messrs. D. E. Orr, M.R.C.V.S., and L. Kirkham; Councillor A. Donovan, Councillor H. Stockdale, and Councillor L. Bailey.

City of Peterborough
Captain W. K. Townson, M.R.C.V.S., and Alderman H. R. Horrell.

City of Portsmouth
Mr. R. Scoular, M.R.C.V.S.

Borough of Preston
Mr. F. J. Proctor, M.R.C.V.S., D.V.S.M.

Students' Unions

Cambridge University Veterinary Society
Mr. M. H. Fussell.

Glasgow University Veterinary Medical Association
Mr. H. Begg.

London Students' Union Society
Mr. A. Clark-Lewis.

Edinburgh Veterinary Students' Committee
Captain T. E. Moore.

OPENING OF THE EXHIBITION OF DRUGS AND INSTRUMENTS

In declaring the Commercial Exhibition open the President said:—

"It might have been an interesting experiment to have set up the exhibits displayed by the drug and instrument firms at the last Congress held in Torquay. We take so much for granted the advances which have been made since that time. The complex therapeutic agents used to-day reflect great credit of the methods of production and careful experimental work which is carried on by the manufacturers. In the Exhibition, which is an integral part of our Congress, we have displayed for our benefit the whole range of veterinary products of the drug houses and the instruments and books with which to keep up-to-date. The representatives of these firms are eager to discuss with us our problems and give us all the help they can.

"We welcome them and hope they will enjoy themselves as I know they will if their only complaint is that their stocks are exhausted and their tongues tired at the end of the week.

"I have much pleasure in declaring this Exhibition open and I hope everyone will find time to visit it on more than one occasion."

Mr. N. MacGregor Black representing the exhibitors responded, and on their behalf presented Mrs. Thomson with a very beautiful tray made at Dartington Hall and decorated with a fine specimen of Honiton lace.

WESTERN COUNTIES "AT HOME"

The traditional "At Home" which precedes the formal opening of Congress was held last Sunday evening at the Palace Hotel, when members of the Western Counties Division and their ladies received nearly 400 delegates.

In a brief speech of welcome Mr. J. D. Dunn, President of the Division, said that the words "at home" were to be taken in their literal sense, not only that evening, but, he hoped, throughout Congress week.

In reply Mr. Thomson, President of the B.V.A., thanked Mr. Dunn and the Division for their welcome and for the generous reception being extended to everyone that evening.

It was clear that the Western Counties Division had nothing to learn about the gracious art of hospitality. A most happy and convivial atmosphere was established from the beginning and prevailed throughout the evening.

OUTBREAKS OF SWINE FEVER ON THE EARL OF SHREWSBURY'S ESTATE

Considerable publicity has been given to an unfortunate outbreak of swine fever which occurred amongst pigs on the Earl of Shrewsbury's Estate at Ingestre, Stafford and the reliability of the official crystal violet vaccine has been questioned.

The following statement, which is issued with the concurrence of the Earl of Shrewsbury, gives the results of the Ministry's investigations into the outbreak.

Ministry of Agriculture's Statement

The Ingestre herd of pigs is *not* registered under the Ministry's Vaccinated Herd Scheme.

History of Outbreak and Origin

In June and early July, 1954, several outbreaks of swine fever were confirmed on premises near the Ingestre Estate piggeries. Routine tracing visits were made by the Ministry's veterinary staff to other farms in the area where pigs were kept. The Estate piggeries were first visited on July 7th. On that occasion, the Estate pigman reported all pigs to be healthy. A second visit was made on July 13th following confirmation the previous day of swine fever in two pigs obtained from the Estate by a neighbouring farmer on July 10th.

Swine fever was confirmed on the Ingestre Estate on July 13th. At that time about 400 pigs were on the premises. The disease spread rapidly, and about half the herd were known to be affected. The rest were salvaged, and appeared to be healthy when sent for slaughter. A small nucleus was retained for breeding.

Enquiries made after the existence of swine fever had been confirmed on the Ingestre Estate revealed that there were some other pigs not shown to the Ministry's veterinary officer on the first visit on July 7th. At that time, these pigs were under treatment privately for suspected paratyphoid.

The circumstances in which swine fever was introduced into the Ingestre Estate herd cannot be precisely determined. The evidence indicates that the disease may have spread from an outbreak in the area or may have been brought on to the Estate by physical contact about the middle of June.

Vaccination

All the pigs on the Ingestre Estate have been vaccinated against swine fever.

Up to February, 1954, crystal violet vaccine issued by the Veterinary Laboratory at Weybridge was used. The official crystal violet vaccine is rigorously tested for safety, reliability and potency before it is supplied to veterinary surgeons. It confers protection against natural infection for about 12 months provided the precautions recommended by the Laboratory are observed. Detailed advice is issued with each bottle.

Since February, 1954, the vaccine used was of foreign origin.

Ninety-four pigs on the Ingestre Estate with swine fever confirmed on July 13th had been vaccinated on June 14th, 1954. The vaccine used was of foreign origin. Also, on July 13th swine fever was confirmed among 18 pigs which were known to have been healthy on July 7th. These pigs were part of a large number vaccinated on May 28th with foreign vaccine obtained some three months earlier.

At the time of the outbreak, some of the pigs had been vaccinated with Ministry of Agriculture crystal violet vaccine. It is not clear from the records which pigs had been vaccinated since July, 1953, and should therefore have been immune. Nor can the records show whether these were all included in the number of about 200 apparently healthy pigs which were salvaged for slaughter. But it seems probable that at least the majority were included.

Conclusions

It is not known how or when swine fever was brought into the Ingestre herd, but it seems probable either that some of the pigs were already incubating it when they were vaccinated on May 28th and June 14th, or that they became affected before the end of the 14 days needed to establish immunity. This is consistent with their appearing healthy at the time of vaccination. The virulence of the outbreak when it was confirmed on July 13th is also consistent with such a history. As the period of incubation can vary from 10 days to as much as six or seven weeks it is impossible to be more precise.

In any event Ministry of Agriculture crystal violet vaccine was not employed in the vaccinations of May 28th and June 14th, and after a searching investigation of all the circumstances associated with the outbreaks of swine fever on the Ingestre Estate, no evidence whatever has been found reflecting on the reliability of official crystal violet vaccine.

COMING EVENTS

Sept. 30th.—Meeting of the Essex Veterinary Society at the Essex Institute of Agriculture, Writtle, 7.30 p.m.

Oct. 7th.—General Meeting of the Central Division, B.V.A., at the Royal Veterinary College, Camden Town, N.W.1.

Oct. 13th.—Meeting of the R.A.V.C. Division, B.V.A., at Guildford Public Abattoir, Woodlands Road, Guildford, 2.15 p.m.

Oct. 13th.—General Meeting of the Midland Counties Division, B.V.A., at the Birmingham Medical Institute, 2.30 p.m.

Oct. 14th.—Meeting of the Supplementary Veterinary Register Division, B.V.A., at 7, Mansfield Street, Portland Place, London, W.1, 2 p.m.

Oct. 20th.—Meeting of the Royal Society of Medicine, Section of Comparative Medicine, at the Society's house, 5 p.m.

Nov. 16th & 17th.—B.V.A. Conference on the Feeding of Farm Livestock for Health and Production in the South Hall, Victoria Halls, Bloomsbury Square, London, W.C.1.

PERSONAL

Births

ADDERLEY.—On September 10th, 1954, at Woking Maternity Hospital, to Margrethe (*née* Ornbo), M.R.C.V.S., and Wg./Cdr. the Hon. M. C. Adderley, A.F.C., R.A.F., a son, Charles Henry.

ARTHUR.—On September 13th, 1954, to Lorna and G. H. Arthur, of Woden Lodge, Goring-on-Thames, a son.

LYONS.—On August 30th, 1954, at Somerleigh Court, Dorchester, to Jo, wife of A. R. Lyons, M.R.C.V.S., of 95, Damers Road, Dorchester, a daughter, Amanda Vivien—a sister for Sonia.

Marriages

RUTTER—IBBETSON.—The marriage between Peter Rutter, Solicitor, of 20, Barton Hill, Shaftesbury, and Jenny Ibbetson, M.R.C.V.S., of Mochwyn Bank, Croesor, Merioneth, took place on Saturday, September 11th at the Friends Meeting House, Shaftesbury.

SAMUEL—BAYLAY.—The marriage took place on September 11th, at St. Nicholas, Brockenhurst, between Richard Michael Samuel, M.R.C.V.S., son of Lieut.-Colonel and Mrs. W. H. Samuel, of Brockenhurst, and Anne Constance, daughter of Mr. J. A. Baylay, of Salcombe and Mrs. C. N. Baylay, of Bexhill.

S.V.R. Obituary

WRIGHT. Walter Edward, of Brunswick House, Victoria Road, Diss, Norfolk. Admitted to the S.V.R. Register August 15th, 1950. Died September 14th, 1954; aged 88 years.

APPOINTMENTS IN THE NATIONAL AGRICULTURAL ADVISORY SERVICE

Mr. W. E. Jones, B.Sc., County Agricultural Officer for Gloucestershire, has been appointed Deputy Director for Wales in succession to Mr. E. Ll. Harry, O.B.E., M.Sc. (AGRIC. ECON.), B.Sc., (AGRIC.), whose appointment as Provincial Director for the West Midland Province was recently announced, and Mr. R. B. Ferro, N.D.A., County Agricultural Officer for the East Riding of Yorkshire, has been appointed Deputy Provincial Director for the Eastern Province in succession to Mr. G. C. Johnson, who is retiring from the Public Service on September 30th, 1954.

ADDRESSES OF DISEASE-INFECTED PREMISES

This list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax:

Ches. Marshfield Bank Farm, Woolstanwood, Crewe (Sept 10); Reeves Farm, Wall Hill, Astbury, Congleton (Sept. 11); Race Farm, Coppenhall, Crewe (Sept. 13).

Lincs. Poplar Farm, North Thoresby, Grimsby (Sept. 11); Shaw's Farm, Ashby-cum-Fenby, Grimsby (Sept. 15).

Warwicks. Gypsy Hall Farm, Wilmcote, Stratford-on-Avon (Sept. 14).

Yorks. Dale Foot Farm, Bishopsdale, Leyburn (Sept. 10); Thornlea Bungalow, Liverton, Loftus, Saltburn-by-the-Sea; Home Farm, Menston, Leeds (Sept. 13).

Fowl Pest:

Norfolk. Says Farm, Worthiell, Harleston (Sept. 18).

Swine Fever:

Cambs. Fletchers Farm, Soham Fen, Soham, Ely (Sept. 14).

Devon. Matford Barton, Alphington, Exeter (Sept. 18).

Dorset. 365, Ringwood Road, Parkstone (Sept. 15).

Flints. Painters Green, Iscoyd, Whitchurch (Sept. 13).

Hunts. Factory Bank, Ramsey Bank, Ramsey (Sept. 15).

Lancs. Piggeries, Conduit Street, Ashton-under-Lyne (Sept. 17).

Lincs. Home Farm, Wilsford, Grantham (Sept. 13); Chapel Point Farm, Chapel St. Leonards, Skegness (Sept. 16); Green Lane Farm, Swinderby, Lincoln (Sept. 17).

Monmouth. Eddis Stores, Llandogo, Chepstow (Sept. 17).

Notts. Corner House Farm, Farndon, Newark (Sept. 13); 44, Bridle Road, Burton Joye, Nottingham (Sept. 17).

Salop. The Wythyns, Wroxeter, Shrewsbury; Aston Farm, Wellington (Sept. 15).

Staffs. "Meltona," Meachalls Lane, Wednesfield, Wolverhampton (Sept. 17).

Suffolk. Grange Farm, Tannington, Woodbridge (Sept. 15).

Wilts. Glebe Farm, Landford, Salisbury (Sept. 16).

Yorks. Top Farm, Campsall, Doncaster (Sept. 17).

ADVERTISER'S ANNOUNCEMENT

The Department of Veterinary Service, Parke, Davis & Company, Limited, Staines Road, Hounslow, announce the introduction of two new veterinary packs.

Chloromycetin Intramuscular 2 g., a microcrystalline preparation in rubber-capped vials for making into a suspension by the addition of water for injection. This product is particularly indicated for administration to large-animal patients and to small-animal patients who will not for various reasons accept oral medication.

Benadryl Parenteral 50 c.c., presents this potent antihistaminic agent in a convenient form for administration to animal patients. This rubber-capped vial has been specially produced to meet the needs of the large-animal practitioner as a multi-dose preparation for administration to cattle and horses where doses of 25 c.c. may be required.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

APPOINTMENTS IN NEW ZEALAND

Sir,—The correspondence on this subject, while an interesting study in humanity, is really rather otiose. The recruiting authority should make an annual statement on the position, in regard to openings and type of practice in the different areas, size of practices and continuity therein of the personnel employed and so on. Metaphorically, individual swallows could continue trying to prove the presence or absence of summer. As a general statement, industry has a more enlightened understanding of the discipline of recruitment than other concerns, excepting the Armed Services.

Yours faithfully,
A. W. HART.

45, Florence Avenue,
Palmerston North,
New Zealand.

September 2nd, 1954.

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VIRUS PNEUMONIA AND CARCASE QUALITY

Sir,—I have recently had the opportunity of examining a number of pig carcases in one of the large London bacon factories, with special reference to the quality of fat too often encountered in pig carcases nowadays.

The important point under consideration is that if carcase quality is to be further improved by tightening up the grading standards, the type of body fat might well be one of the factors to be taken into consideration.

In examining these carcases, a relationship between the presence of virus pneumonia and fat quality appeared to exist. The more extensive the pneumonia, the worse the carcase and fat quality. It is quite possible that the slowing up of the growth rate, as a result of infection, might well result in the deposition of soft fat.

The writer wonders whether those of us who have the opportunity to make observations on this matter could perhaps do so and record their findings in this journal.

Yours faithfully,
W. M. McKAY.

40, St. Mary Axe,
London, E.C.3.

September 7th, 1954.